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Bibliography on Glaze and Rime at the Earth's Surface, p. 1066

3 · October, 1952 · No. 10

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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SUBSCRIPTION RATE: $6.00 per year to members and non members. Single and back issues $2.00. Back volumes, $10 per volume.

This publication has been made possible through support and sponsorship extended by the Geophysics Research Directorate of the Air Force Cambridge Research Center, Air Research and Development Command under Contract No. A. F. 19 (604)-302.

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 3 OCTOBER 1952 No. 10

AGRICULTURE · COMMERCE · AERIAL AND MARINE NAVIGATION · PUBLIC HEALTH · INDUSTRY · ENGINEERING
AMERICAN METEOROLOGICAL SOCIETY
1919

SPECIAL FEATURE IN THIS ISSUE

A Selective Annotated Bibliography on Glaze and Rime at the Earth's Surface

(For complete table of contents see back cover)

Published monthly at Prince and Lemon Streets, Lancaster, Pa., by the AMERICAN METEOROLOGICAL SOCIETY, 3 Joy Street, Boston 8, Mass.

Printed and issued by: Lancaster Press, Inc.

FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains from 175 to 300 abstracts of current periodical literature and monographs in the fields of meteorology, hydrology, oceanography, etc. These abstracts are arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of from 50 to 250 important references on a special subject without respect to recency of material. No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject. Preference is given to recent material, comprehensive works, material from obscure sources, and items with good bibliographies.

Bibliographies previously published were:

No.	Mo.	Vol. I, 1950	Vol. II, 1951
1.	Jan.	**Atmospheric Pollution**	**Extended Forecasting**
2.	Feb.	**Aerobiology**	**Long Range Forecasting**
3.	March	**Cloud Physics and "Rain Making"**	**Soil Temperature**
4.	April	**Hail**	**Constants, Units, Tables and Diagrams**
5.	May	**Tornadoes**	**Climate of the Near East**
6.	June	**Volcanic Dust**	**Climate of the Middle East**
7.	July	**Climatic Changes**	**Special Winds**
8.	Aug.	**Thunderstorms**	**Radar Storm Detection**
9.	Sept.	**Icing**	**Condensation Trails**
10.	Oct.	**Acoustical Propagation**	**Climate of Northeast Africa**
11.	Nov.	**Evaporation**	**Mountain Meteorology**

Bibliographies published this year were:

1. **Climatology of Northwest Africa,** Vol. III, No. 1, Jan. 1952
2. **Carbon Dioxide,** Vol. III, No. 2, Feb. 1952
3. **Climate of Paraguay, Uruguay and Argentina,** Vol. III, No. 3, March 1952
4. **Dew,** Vol. III, No. 4, April 1952
5. **Objective Forecasting,** Vol. III, No. 5, May 1952
6. **Stratus Forecasting,** Vol. III, No. 6, June 1952
7. **Urban Climatology,** Vol. III, No. 7, July 1952
8. **Climate of Central and West Africa,** Vol. III, No. 8, Aug. 1952
9. **Visibility,** Vol. III, No. 9, Sept. 1952
10. **Glaze and Rime,** Vol. III, No. 10, Oct. 1952

Forthcoming bibliographies will be:

11. **Free Air Turbulence,** Vol. III, No. 11, Nov. 1952

Other bibliographies in preparation are:

Actinometers
Arctic Meteorology
Auroral Physics
Climate and Cancer
Climate of Australasia
Climate of Southeast Asia and the East Indies
Frost and Frost Forecasting
High Level Winds
Machine Methods in Meteorology
Microwave Propagation
Oceanographic Meteorology
Ozone
Tropical Cyclones
Tropopause Variations
Turbulence

Part III contains a listing of the contents of those journals which are primarily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. In the June and December issues cumulative indexes are published.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where th material may be found. The Union List of Serials (Gregory) is the source of most of th symbols used. In some cases, where no symbol has been assigned to a library, one will b devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DSG:	U. S. Army Medical Library, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory (and American Meteorologic Society) Library, Milton, Mass.
NN:	New York Public Library, New York, N. Y.
NNA:	American Geographical Society Library, New York, N. Y.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by chart

Geographic locations are in the English form rather than the form used locally, for exampl Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwi stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to t Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months a abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Numb (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus entry will read as follows:

Meteorologische Rundschau, 2(5–6):146–151, May–June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (V 2), *Heft* 5–6 (No. 5 and 6), *pages* 146–151, May–June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGY MATERIAL

COMPENDIUM ARTICLES AND WORKS OF SPECIAL INTEREST

3.10–1 551.575.1:551.574.1:551.509.67

†Amelin, A. G., **Teoreticheskie osnovy obrazovaniia tumana v khimicheskikh proizvodstvakh.** [Theoretical bases of fog formation in chemical processes.] Moscow, Goskhimizdat., **1951.** 169 p. 41 figs., 29 tables, 90 refs., equations. **DLC**—Although intended for chemists or laboratory workers in the physical sciences or industry, this book contains many chapters of interest to meteorologists working in the field of cloud physics. The first chapter takes up fog formation by condensation (supersaturation, critical limits for saturation in the presence and absence of ions or nuclei, dependence on temperature, amount of liquid in fog, examples of supersaturation). Chap. 2 is concerned with the formation of fog by adiabatic expansion (including radiation fog formation); Chap. 3 on fog formation by mixing; Chap. 4 by chemical reactions and Chap. 5 on relation of fog formation to condensation of vapor on various surfaces (including artificial formation with use of solid CO_2, by SCHAEFFER). In the last chapter (6), on mechanical formation of fog, there are discussions of quantitative experiments on drop size distribution and evaporation of drops in fogs. *Subject Headings:* **1. Cloud physics 2. Fog formation 3. Artificial fog 4. Condensation nuclei 5. Drop size distribution.**—*M.R.*

3.10–2 551.501.8:06

Bowen, E. G., **Recent work of the Radiophysics Division, C. S. I. R. O.** *Institution of Radio Engineers, Australia, Proceedings,* Sydney, 12:99–108, **1951.** 18 figs.—Includes an account of structure of "freezing" and nonfreezing rain as shown by radar from the air and ground, with photos; measurement of raindrop sizes and water content in the air by a transmitter carried by balloon; and experiments in rain making by dry ice. Vertical air velocity in a cloud was measured by airborne radar and cloud samples were taken. Wind finding by radar using balloons coated with a silver film gave profiles up to 100,000 ft. A glider carrying meteorological instruments and homing on a radio beam is being developed. Sec. 3 deals with radio astronomy. *Subject Headings:* **1. Radar analysis of rain 2. Cloud physics 3. Artificial precipitation 4. Radarsondes.**—*C.E.P.B.*

3.10–3 551.582.1(492)

*†Braak, Cornelius, **Het Klimat van Nederland.** [The climate of the Netherlands.] The Hague, Servire, **1950.** 88 p. 36 tables, 22 figs., 48 refs. Servire's encyclopaedie, A, 3 Natuurkunde, v. 7. **DWB**—A concise, brief, nontechnical description of the climate of the Netherlands. The characteristics of the individual meteorological variables are described with the aid of isoline charts and graphs. The individual chapters are as follows: air pressure and wind, precipitation, sunshine and cloudiness, haze and fog, air temperature and soil temperature, humidity, evaporation, and thunderstorms. A good bibliography and tables giving summaries of wind frequencies and wind strength, precipitation amount and duration, mean number of rain days, mean daily course of sunshine and cloudiness, mean daily temperature, maxima and minima of temperature, daily march of temperature and relative humidity are included. *Subject Headings*: **1. Climate of the Netherlands 2. Netherlands.**—*I.L.D.*

3.10–4 551.558:551.551

Frankenberger, Ernst, **Untersuchungen über den Vertikalaustausch in den unteren Dekametern der Atmosphäre.** [Investigations of the vertical exchange in the lowest dekameters of the atmosphere.] *Annalen der Meteorologie,* 4(7/9):358–374, **1951.** 18 figs., 15 refs.,

9 equations. German and English summaries p. 358. Addendum: p. 374, fig. **DWB—A** new, sensitive, electrically recording Assmann psychrometer is described. Four were used at Quickborn (Holstein) to record temperature and humidity differences between 70, 28, 13 and 2 m heights above a plain, in conjunction with horizontal and vertical wind velocity records. These profiles agree with estimates by the boundary-layer theory. Nature and influence of convective exchange are discussed. The ratio between geostrophic wind and that at 70 m is related to difference of potential temperature 70–10 m. Some calculations are made of shares of convection and turbulence in total exchange. Observations in a shallow valley showed that vertical exchange of momentum averaged 40% less than over large plains; surface temperature and humidity and their vertical gradient are consequently greater in such valleys. *Subject Headings:* **1. Austausch 2. Humidity lapse rate 3. Lapse rates 4. Vertical velocity.**—*C.E.P.B.*

3.10–5 551.579(43):06

Germany. Preussische Landesanstalt für Gewässerkunde, **Gedenkschrift der Bundesanstalt für Gewässerkunde zur 50-jährigen Wiederkehr der Gründung.** [Memorial volume of the Federal Institute for Hydrology on the 50th anniversary of its founding.] *Deutsches Gewässerkundliches Jahrbuch, Besondere Mitteilungen*, Bielefeld, No. 4, **1952.** 140 p. figs. tables, refs.—Contents: GERHARD SCHROEDER, Rückblick und Ausblick. [Retrospect and prospect.] p. 6–9; OTTO LANGE, Entwicklung des Pegelwesens. [Development of levelling.] p. 10–28, 16 figs.; WILHELM LOHRBERG, Höhenanschluss von Pegeln bei grossen Zielweiten. [Height connection of levels for objects at great distances.] p. 29–40, 4 figs., tables; ARTHUR HAHN, Die nicht periodischen Schwankungen der Tidescheitel bei Wilhelmshaven im hydrologischen Jahre 1940. [The nonperiodic variations of high tide at Wilhelmshaven in the hydrologic year 1940.] p. 41–55, 3 figs., tables; WILHELM FRIEDRICH, Zur Berechnung der Gebietsniederschläge von Flussgebieten. [On calculating the regional precipitation of river basins.] p. 56–71, 2 figs., 7 tables (abstracted separately); WERNER KOEHNE, Das erste nach gewässerkundlichen Gesichtspunkten bemessene Wasserwerk. [The first waterworks measured from the point of view of water management.] p. 72–77; DUDOLF GRAHMANN, Über die hydrogeologischen Grundlagen der Wasserversorgung in Westdeutschland. [On the hydrogeological bases of water conservation in W. Germany.] p. 78–91, map; HUBERT WAGNER, Die Verwendung von Thermographen in fliessenden Gewässern. [The use of thermographs in flowing water.] p. 92–105, 3 figs., 4 tables [includes curves and tables of hourly and extreme temperature of the Werre at Lohne, May 1950–April 1951]; HEINRICH SCHMIDT, Die Bedeutung der Pflanzensoziologie in der Gewässerkunde. [The importance of plant associations in hydrology.] p. 106–112; FRITZ LIPPERT, Die Reinhaltung des Rheins—eine internationale Aufgabe. [Keeping the Rhine clean—an international problem.] p. 113–125, 3 figs., 2 tables; PAUL SANDER, Gewerbliche Abwässer und ihre Behandlung. [Industrial waste water and its treatment.] p. 126–133; JOHANNES GENNERICH, Beiträge zur Ernährungsphysiologie und Systematik der Abwasserpilze Leptomitus lacteus (Roth) Agardh und Sphaerotilus natans Kutzing. [Contributions to nutrition physiology and systematics of waste water fungi. . . .] p. 134–140, 61 refs. *Subject Headings:* **1. Tides 2. Water supply 3. Water temperatures. I. Schroeder, Gerhard II. Lange, Otto III. Lohrberg, Wilhelm IV. Hahn, Arthur V. Friedrich, Wilhelm VI. Koehne, Werner VII. Grahmann, Rudolf VIII. Wagner, Hubert IX. Schmidt, Heinrich X. Lippert, Fritz XI. Sander, Paul XII. Gennerich, Johannes.**—*C.E.P.B.*

3.10–6 551.582.2(51

*†Gherzi, Ernesto, **The meteorology of China.** Macao, Serviço Meteorológico, **1951** 2 v. figs., maps, graphs, tables, 198 refs. in bibl. p. 377–388. **DWB**—One of the most comprehensive works on the climatology of an area yet published. The manuscript was ready for the printer in 1939 but publication was delayed due to the war. After the war it was supplemented but during the occupation of Zi-ka-wei in 1949 these revisions were lost and so the present work is essentially that which was ready for printing in 1939. Vol. I contains a detailed discussion (with numerous charts, tables, graphs and diagrams) of air masses, pressure, temperature, cold waves, hot waves, rain, humidity, wind at surface and aloft, extratropical cyclones, tropical cyclones and a discussion of the "climatic regions" of China (52 areas)

Numerous tables of local weather records and an index add to the value of this work. Vol. II is a large compilation of detailed tables and graphs, synoptic charts, storm tracks, microseism records, climagrams, barograms for typhoons, upper level charts (mean), soundings, contingency tables for temperature, humidity, evaporation, rainfall, fog, surface winds, upper air winds, frost, gusts, isentropes, etc. The variety of material and types of presentation is astonishing. The number of stations for which data are compiled varies from 1 to 215. Of course the most valuable portion is that which deals with typhoons, since FATHER GHERZI has made a lifetime study of tropical storms in the Far East. Many of the illustrative synoptic charts for typhoon situations are in color. The printing and paper are first class, though typographical errors are numerous in some sections. A valuable station location chart is included. *Subject Headings:* **1. Climate of China 2. Typhoons 3. Synoptic studies 4. Climatic data 5. China 6. Far East.**—*M.R.*

3.10–7 551.581:551.513:551.515.8

Grimes, A., **Equatorial meteorology.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 881–886. 9 refs., 15 equations.) **MH-BH**—The equatorial region is defined as the area between latitudes 15°N and 15°S. This review covers the following subjects: the source and characteristics of equatorial air masses; the nature of the various frontal phenomena, namely: the intertropical front, meridional fronts and subsidiary fronts; the solution by means of spherical polar coordinates of integral equations of motion allowing for variations in the Coriolis force with latitude on the assumption of steady frictionless motion without change of velocity with longitude and of the equations of frictionless horizontal motion in which latitude is eliminated; and the problem of forecasting in equatorial regions. *Subject Headings:* **1. Equatorial meteorology 2. General circulation 3. Air masses 4. Fronts.**—*I.L.D.*

3.10–8 550.34:551.596.1

†Gutenberg, B. (*Calif. Inst. of Tech.*), **Observations and theory of microseisms.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 1303–1311. 5 figs., 2 tables, 38 refs., 8 equations.) **MH-BH**—The various types of microseisms, except those resulting from movements of the ground due to traffic and industry, are described in terms of their periods; typical records of microseisms are shown and the possible cause of each type, namely: windstorms, surf, pressure changes, etc. are discussed. The various theories which have been formulated mathematically to explain the transmission of energy from meteorological disturbances into the ground and the propagation of microseismic waves in the ground to the point of observation are summarized. The former includes the theories for the transmission of energy from surf, the theory of the propagation of waves from the surface of the ocean to the bottom (SCHOLTE), the theory of propagation of elastic waves in a medium consisting of the upper layer of water overlying a homogeneous layer of solid rock (PRESS and EWING) and the theoretical periods of pressure waves in the ocean. The latter deals with the characteristics of the wave types observed in microseisms, namely: the body waves and surface waves, the increase in period with distance, the influence of structural differences in the earth's crust, of faults and of the ground upon which instrument is located upon microseisms. A proposed plan for further research is outlined. *Subject Headings:* **1. Microseisms 2. Acoustical propagation.**—*I.L.D.*

3.10–9 551.582.1:551.586:58(98)

†Hare, F. Kenneth (*McGill Univ.*), **Some climatological problems of the Arctic and sub-Arctic.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 952–964. 2 figs., table, 69 refs.) **MH-BH**—The general literature on the climatology of the Arctic regions is reviewed briefly and the inadequacy of meteorological data for the Arctic is stressed. The work of HUSTICH, SANDERSON, etc. on the relationship between climate and vegetation in the Boreal forest is reviewed critically and the author concludes that over most parts of the Boreal region of the earth, the midsummer temperature is the principal factor determining variations in growth of the common tree-species and that variations in summer precipitation have little or no effect on tree growth except near the forest steppe boundary. The zonal divisions of natural vegetation—the Arctic tree line, the Boreal forest

proper and the southern limit of Boreal forest—are correlated with SUPAN, KÖPPEN and NORDENSKJÖLD isotherms and with THORNTHWAITE's thermal efficiency function with which a high correlation is found. The correlation between climate and permafrost is briefly summarized. The general problem of the influence of ice formation on air masses and the climatological conditions favoring ice formation are reviewed with particular reference to recent studies on the climatology and ice conditions in Hudson Bay. Finally, the problem of the "glacial anticyclone" is reviewed. The data of Hobbs are presented and the contradictory data based upon recent exploration are presented. *Subject Headings:* **1. Climatology 2. Vegetation 3. Ice formation 4. Arctic.**—*I.L.D.*

3.10–10 551.501.81

†Ligda, Myron G. H. (*Mass. Inst. of Tech.*), **Radar storm observation.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 1265–1282. 16 figs., table, 71 refs., 4 equations.) **MH-BH**—Assuming the validity of the theoretical basis of the application of radar to hydrometeor detection and to the study of storm structure, the author presents a comprehensive review of the observational and practical aspects of radar storm detection. The article includes: a brief history of the beginning of radar storm detection before World War II; an analysis of the meaning of the factors pertaining to the radar system in terms of which the power received at the antenna due to the echo precipitation is expressed; the problem of the observational verification of radar storm detection theory; the observation of weather phenomena on radar scopes including a description of the type of scopes (A scope, R scope, Plan Position Indicator or PPI Scope and the Range Height Indicator or RHI scope), and a detailed description of the scopes during the various types of precipitation (frontal and orographic precipitation, hurricanes or typhoons and instability showers); an analysis of the radar storm echo signal by nonvisual means, e.g., the pulse integrator, the radar signal spectrograph and storm echo signal contouring and by the use of radar scope photography. The future of radar storm detection is discussed with reference to its use in forecasting, the development of instruments such as horizon to horizon RHI scope and the Gated Range Height Indicator and the use of radar for research in physical meteorology. *Subject Headings:* **1. Radar storm detection 2. Radar photographs.**—*I.L.D.*

3.10–11 551.509.3:550.34

Macelwane, James B. (*St. Louis Univ.*), **Practical application of microseisms to forecasting.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 1312–1315. 9 figs., 5 refs.) **MH-BH**—The nature and origin of those groups of microseisms which are neither of earthquake origin nor local disturbances due to traffic or industrial activity but which are characterized by wave periods of 4 to 7 seconds are related to meteorological and geological conditions surrounding the recording station, to steep barometric gradients on land or sea, to beating surf on a rocky coast and to storm centers at sea. The method of tripartite stations with dimensions less than one wave length to determine the direction and speed of wave propagation as developed by Ramirez, and procedure for tripartite analysis used by the U. S. Navy are described. The inadequacy of various explanations of the mechanism producing these microseisms is pointed out. A brief description of groups of microseisms having a dominant period of two seconds is presented and mention is made of a group of microseisms with frequency of two to three cycles per second being investigated at St. Louis University. *Subject Headings:* **1. Microseisms 2. Weather forecasting.**—*I.L.D.*

3.10–12 551.585 551.513.1

†Palmer, C. E., **Tropical meteorology.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 859–880. 4 figs., 73 refs.) **MH-BH**—A comprehensive and masterly discussion of the history of the development of the climatological method, the air mass method and the perturbation method for investigating tropical meteorology; of the theoretical principles and the empirical data upon which these methods are based; of the value and usefulness of each method for explaining the general tropical circulation and individual tropical weather phenomena and their usefulness in synoptic meteorology in tropical regions. The theoretical discussion is nonmathematical. The achievements of these methods of approach to tropical meteorology are evaluated and possible lines of development for each

of these methods are outlined. *Subject Headings:* **1. Tropical meteorology 2. Atmospheric circulation 3. Synoptic meteorology.**—*I.L.D.*

3.10–13 551.521(436)

Schedler, A., **Ein Beitrag zur Kenntnis der Global- und Himmelsstrahlung im Hochgebirge der Alpen (nach Messungen in Hochserfaus, 1817 m.).** [A contribution to knowledge of the global and sky radiation in the High Alps (from measurements in Hochserfaus, 1817 m).] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B,* 4(1):14–25, **1952.** 3 figs., 8 tables, 7 refs. German, English and French summaries p. 14–15. **DWB**—Observations were made with 2 Robitzsch actinographs. Table gives monthly values of global radiation on a horizontal surface, solar radiation allowing for cloudiness, difference (=sky radiation) and sunshine duration in %. Comparisons are made with Davos and with values at 3000 m. Relation of sky/global radiation at different seasons is calculated for different sunshine percentages (0–100); the relation is not linear. Sky radiation is much greater in spring than autumn, owing to reflection from snow surfaces. A method of calculating radiation amount for constant cloudiness is described. *Subject Headings:* **1. Radiation calculations 2. Global radiation 3. Alps.**—*C.E.P.B.*

3.10–14 551.583:634.94:529(09)

†Schulman, Edmund, **Tree-ring indices of rainfall, temperature, and river flow.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 1024–1029. 4 figs., 2 tables, 28 refs.) **MH-BH**—A comprehensive and succinct review of the history of dendrochronology. The underlying principles of selection, cross dating and sensitivity of trees; the methods of core sampling, preparation of cores, etc.; errors in the unit of individual tree ring and possible causes of these errors; causes of errors of interpretation of dendroclimatic series; the relation of dendrochronology to meteorology, astronomy, geology, botany, forestry, etc. are discussed; a description of tree ring series showing indications of past rainfall and river flow in western United States and of the relationship between tree ring fluctuations and temperature in the Arctic is presented; and the use of tree ring chronologies as indicators of long term climatic fluctuations is reviewed. *Subject Headings:* **1. History of dendrochronology 2. Climatic variations 3. Tree ring indexes 4. Western United States 5. Arctic.**—*I.L.D.*

3.10–15 551.5(26) 551.582

Tannehill, Ivan Ray (*U. S. Weather Bureau*), **Weather around the world.** 2nd ed. Princeton University Press, **1952.** 212 p. 59 figs., 5 tables, foot refs. **DWB**—In the introductory chapters of this world weather guide for travellers, first printed in 1943, meteorological phenomena, and particularly those prevailing over the oceans, are discussed in nontechnical terms and illustrated on charts and with cloud photos. The individual weather character of nine major regions of the earth is outlined. Data on average temperature and humidity, on extremes of temperature, on rainy days and cloudiness and on days with snow for 110 cities and temperature and precipitation data for another 75 places in the world are appended in tabular form. *Subject Headings:* **1. Marine meteorology 2. Urban climates 3. Global circulation 4. World climate.**—*G.T.*

GENERAL METEOROLOGY

(*See also item:* 3.10–15)

3.10–16 551.5:016

†Australia. Meteorological Branch, **Library circular.** No. 1, July 1940; last No. received No. 100, June **1952. DWB**—A monthly or bi-monthly compilation of the accessions of the library of the Meteorological Service at Melbourne. The entries are arranged according to the Universal Decimal Classification (UDC) system for meteorology (551.5) and are subdivided according to the major headings (i.e., climatology, visibility, optical phenomena, electrical phenomena, etc.). Each issue contains from 100 to 200 or more references without annotations. Double U.D.C. headings are used sparingly and when used the item is not cross referenced.

A valuable and easily used periodical bibliography. *Subject Headings:* **1. Bibliographies 2. Accession lists 3. U.D.C. catalogs 4. Australia.**—*M.R.*

3.10–17 551.5:0

Germany. Deutscher Wetterdienst in der U. S. Zone. **Die meteorologische Tagung in Bad Kissingen vom 12. bis 15. Oktober 1951.** [The meteorological meeting in. . . *Germany. Deutscher Wetterdienst in der US-Zone. Berichte*, No. 35, 1952. 328 p. figs. **MH-BH** Following an introductory session opened by L. WEICKMANN and an address on "Meteorology and life" by W. HELLPACH the meeting included six sessions: I. Large scale synoptic and medium range forecasting; II. Atmospheric dynamics; III. Evaporation; IV. Atmospheric electricity, Ionosphere; V. Bioclimate, Aerosol, Climate; VI. Methods of measurements, Instruments. The individual papers will be abstracted separately. *Subject Heading:* **1. Meteorological conferences.**—*C.E.P.B.*

3.10–18 551.5:06 551.509

International Meteorological Organization. Regional Commission II, Asia. **First session at New Delhi from 10th to 20th November, 1948, abridged final report.** *Organisation Météorologique Internationale, Publication* No. 76, 1950. In English and French. 66 p. photo maps, tables. Price: Sw. Fr. 3. —**DWB**—During this session 25 items of agenda were discussed and 45 resolutions and recommendations passed regarding network of surface, upper air radioelectric and aircraft observatories, telecommunication and broadcasting, codes and units observations, reconnaissance flights, aeronautical, agricultural and marine meteorology weather ships, hydrology, study of tropical clouds, determination of winds at high altitudes etc. Text of resolutions is given in English and French. Proposed subcontinental and national broadcast schedules are presented as well as two maps showing areas chosen for shipping forecasts in Indian and Pacific Oceans and areas from which ships' reports are required. Publications of the IMO are listed. A list of persons present with photographs identifying them, a list of members and a list of documents consulted are included. *Subject Headings:* **1. IMO Conferences 2. IMO Resolutions 3. IMO Publications 4. Asia.** —*G.T.*

3.10–19 551.5:06 551.509

International Meteorological Organization. Regional Commission VI, Europe. **Quatrième session à Londres du juin au juillet 1949, rapport final abrégé.** [Final abridged report of the 4th session at London, June 27 July 2, 1949.] *Organisation Météorologique Internationale, Publication*, No. 77, 1950. 70 p. codes. In English and French. Price: Sw. Fr. 3. **DWB**—The agenda and a brief review of discussions is given in French. The commission held 7 plenary meetings and formed 3 temporary subcommittees—one for codes, one for telecommunications and broadcasts and one for symbols and units. The text of the 4 resolutions, most of which relate to the coordination and communication of reports, is presented in English and French. Resolution No. XIII contains a 4-letter system of identifying meterorological messages through indication of type of report and geographical designation. Recommended broadcasting and teleprinting schedules are shown on tables. A list of members of Regional Commission VI (Europe) and the names of persons present at the session are added and the documents consulted are listed. *Subject Headings:* **1. IMO Conferences 2. IMO Resolutions 3. IMO Publications 4. Europe.**—*G.T.*

3.10–20 551.5:0

International Meteorological Organization. Regional Commission V, South West Pacific. **Second session at Wellington from 12th to 17th April 1948, abridged final report.** *Organisation Météorologique Internationale, Publication* No. 74, 1948. 27 p. In English and French. Price: Sw. Fr. 2.00. **DWB** Thirty-two items of agenda were discussed during this session and 20 resolutions passed regarding regional codes, exchange of information, telecommunications and broadcasts, index numbers, upper air observations, ships' reports, etc. Text of resolutions is given in English and French. A list of members of the commission, of persons present at the session, and of documents consulted is presented. *Subject Headings:* **1. IMO Conferences 2. IMO Publications.** —*G.T.*

3.10–21 551.5:06(71)551.501.9

Thomson, Andrew, **Expansion of the Canadian Meteorological Service since 1939.** *International Union of Geodesy and Geophysics, Association of Meteorology, Oslo, 1948, Procès-verbaux*, 3:6–7, Nov. **1950.** In English. **DWB**—Increase in number of surface reporting stations (168), pilot balloon stations (64), development of radiosonde network (23 stations), teletype networks (19,000 miles), radio networks, Arctic stations, new forecast stations, aviation meteorology service for land and transocean flying, research and training during the war are outlined. *Subject Headings:* **1. Canada. Meteorological Division 2. Meteorological networks 3. Canada.**—*M.R.*

3.10–22 551.5(08)(675)

Belgian Congo. Service Météorologique, **Bulletin,** No. 1, Jan. **1951.** tables. In French; French, Dutch, English and German summaries. **DWB**—The first of a hectographed journal series published by members of the staff of the Belgian Congo Meteorological Service. It contains two sections, one with a few articles by staff members and one with fairly elaborate summaries of observational data obtained during that month from the network of stations in the vast area of the Belgian Congo (complete with surface and upper air wind roses, histograms for sunshine, precipitation, temperature and relative humidity). On inside covers the synoptic stations in the network of the Belgian Congo (74) and in Ruanda-Urundi (3) are listed and the coordinates, elevation, type of station and code number are given. (*Same as MAB* 3H-210, Sept. 1952.) *Subject Headings:* **1. Periodicals 2. Monthly climatic reports 3. Synoptic networks 4. Belgian Congo 5. Ruanda-Urundi.**—*M.R.*

3.10–23 551.5(09):06(410)

Goldie, A. H. R., **Research in the Meteorological Office 1939–1948.** *International Union of Geodesy and Geophysics, Association of Meteorology, Oslo, 1948, Procès-verbaux*, 3:117–125, Nov. **1950.** In English. **DWB**—Work of Meteorological Research Committee, work of observatories in United Kingdom, research flights into stratosphere, special stations for micrometeorology, etc., results of research, long and short range forecasting, airplane research (icing, controls, gustiness), stratosphere exploration (extreme dryness of low stratospheres explained), smoke trail wind investigations, propagation of sound, sferics and atmospheric electricity research reported. *Subject Headings:* **1. Meteorological research 2. Stratospheric research 3. Great Britain. Meteorological Office 4. British Isles.**—*M.R.*

3.10–24 551.5(09)

Kassner, Carl, **Meteorologische Geschichtstabellen.** [Chronological meteorological tables.] (In Linke, Franz (*ed.*), **Meteorologisches Taschenbuch.** [1951 ed.] Leipzig, Akademische Verlagsgesellschaft Geest & Portig, **1951.** v. 1. p. 330–359. Abstracted from reprint.) **DWB**—The historical tables first published in Linke's "Meteorologisches Taschenbuch" (1931) are expanded and brought up to date (1947). Sec. (A) gives the oldest non-instrumental and instrumental observations in each country; (B) gives hundreds of citations of important events from 520 B.C. to date—discoveries, publications, etc. (C) gives a shorter list of historic dates in forecasting and (D) and (E) list German and international conferences. *Subject Headings:* **1. History of meteorology 2. Chronology 3. Linke's Taschenbuch.**—*M.R.*

3.10–25 551.5(09):06(494)

Lugeon, Jean and Kuhn, Walter, **Comité National Suisse de l'Union Géodésique et Géophysique Internationale.** [Swiss National Committee of the International Union of Geodesy and Geophysics.] *International Union of Geodesy and Geophysics, Association of Meteorology, Oslo, 1948, Procès-verbaux*, 3:206–215, Nov. **1950.** In French. **DWB**—Report on work in Switzerland in 23 separate fields of meteorology during war years. Also list of institutes and of Swiss persons who published during that period (with addresses). *Subject Headings:* **1. Meteorological research 2. Meteorological services 3. Switzerland.**—*M.R.*

3.10–26 551.5(09)(410)

†Sutcliffe, R. A., **Physical processes.** *International Union of Geodesy and Geophysics, Association of Meteorology, Oslo, 1948, Procès-verbaux*, 3:145–150, Nov. **1950.** 44 refs. In

English. **DWB**—Report on work, 1939–1947, in the following fields of physical meteorology: 1) Radiation, 2) Condensation and cloud physics, 3) Anemometry, 4) Synoptic and dynamic meteorology, 5) Climatology and, 6) Applied meteorology. *Subject Headings:* **1. Progress in physical meteorology 2. British Isles.**—*M.R.*

3.10–27 551.5(09)(493)(675)

Van Mieghem, Jacques, **La météorologie en Belgique de 1939–1948.** [Meteorology in Belgium, 1939–1948.] *International Union of Geodesy and Geophysics, Association of Meteorology, Oslo, 1948, Procès-verbaux*, 3:2–5, Nov. **1950.** In French. **DWB**—A report of important works carried out in Belgium and Belgian Congo in the field of climatology (Poncelet, Martin, E. Bernard and Vanderplas), in agricultural meteorology (De Backer), radiation (Nicolet, Bossy and Pastiels), synoptic and aerological meteorology (Van Mieghem, Dufour, et al), dynamic meteorology (Dufour and Van Mieghem), and history of meteorology (Dufour), during the period 1939–1948. *Subject Headings:* **1. Meteorological research 2. Progress in meteorology 3. Belgium 4. Belgian Congo.**—*M.R.*

3.10–28 551.5:358.4:629.13

Meteorology and the operation of jet aircraft. *Royal Meteorological Society, Quarterly Journal*, 78(337):427–456, July **1952.** figs., table, photos, refs. **DWB**—This discussion on Feb. 20, 1952, was opened by G. Silyn Roberts with a paper on "Meteorological phenomena of interest in the design and flying of jet-propelled aircraft," especially turbulence at all heights. A. M. A. Majendie set out "The meteorological requirements for the operation of turbo-jet civil airlines (based on early experience with the De Havilland Comet)"—forecasts of mean and upper level wind and temperature and high level cloud, and defects of present knowledge. C. G. Lott on "Military jet-aircraft operations and meteorology" also emphasized the importance of accurate forecasts, especially of high-level turbulence. G. J. W. Oddie, "Special problems of forecasting for jet aircraft," discussed some of these forecasting problems and how they are likely to be met, and C. S. Durst, "High-level winds and temperatures for jet aircraft operations," summarized the statistical problems especially of high level winds. A general discussion followed, especially on clear air turbulence, condensation trails and jet streams. P. A. Sheppard, "Some deficiencies in current meteorological knowledge in relation to the operation of jet aircraft," summed up with 7 pertinent questions suggesting lines of research. *Subject Headings:* **1. Aeronautical meteorology 2. Airways forecasting 3. Jet. transport operation.**—*C.E.P.B.*

3.10–29 551.5:92 551.578.46

Church, James E., **Science and adventure.** *Western Snow Conference, Proceedings*, 17th Annual Meeting, April **1949.** p. i–xiii. **DWB**—Brief notes on adventures of Dr. Church from his first winter mountain ascent in 1895, to ascents and later meteorological or snow surveys in Russia, India, and the Andes, Alps, Himalayas, Greenland Icecap, Canadian Rockies, etc. In 1906 he climbed Mt. Rose, Nevada, (10,800 ft) every month to obtain mountain top temperatures for the U. S. Weather Bureau. This led to his studies of snow and development of Mt. Rose snow sampler, the laying out of snow courses and measuring water content of snow. Studies of effects of timber on snow, retention and streamflow were made in 1910–1912 and since. Effect of glaciers considered minor. Accuracy within 10% cannot be expected in forecasts. His latest project is on a snow surveying system for Argentine-Chilean Andes to be contained in a 325-page report in Spanish. *Subject Headings:* **1. Snow surveys 2. Biography 3. Mt. Rose, Nevada 4. Church, J. E.**—*M.R.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

(*See also items:* 3.10–2, 3.10–10, 3.10–21, 3.10–54, 3.10–131, 3.10–201, 3.10–220, 3.10–228)

3.10–30 551.501:551.582(6)

Schumann, Theodor Eberhardt Werner (*Weather Bur., S. Africa*), **Meteorological research in Africa.** (In: **African Regional Scientific Conference, Johannesburg, Oct. 17–28, 1949.**

2:34–37, 1950. In English, French summary p. 34.) **DWB**—In order to further our knowledge of the climate of Africa, the author proposes the following program for meteorology, viz.: the preparation of a climatological atlas for Africa, the preparation of meteorological and climatological bibliographies for central and northern Africa complementary to the bibliography for South Africa (*see MAB* 2.5–5, May 1951), the standardization of meteorological units, manufacture of meteorological instruments for radiosonde stations, the establishment of meteorological stations by any meteorological service in territory beyond its own borders, exchange of scientific personnel and establishment of a central meteorological institute. *Subject Headings:* **1. Meteorological research 2. Meteorological networks 3. Observation techniques 4. Africa.**—*I.L.D.*

3.10–31 551.501.4:551.55

Ratner, Benjamin, **A method for eliminating directional bias in wind roses.** *Monthly Weather Review*, 78(10):185–188, Oct. **1950.** 4 figs., table, 6 equations. **DWB**—Many observers show a bias in favor of 8 prime wind directions compared with intermediate points. A simple method of correcting observations for this bias is given, which assumes that the total number of winds from the 8 prime directions equals the total from the 8 intermediate directions. *Subject Headings:* **1. Wind computation 2. Wind roses.**—*C.E.P.B.*

3.10–32 551.501.7:551.507.362

Beth, Eric Walter, **Discussion of a method for the investigation of pressure, temperature, average molecular weight, wind velocity and dissociation in the upper atmosphere.** *U. S. Air Force, Air Materiel Command, Report* No. 5–10, July 22, **1947.** 39 p. tables. **DWB**—Details of theoretical method for calculating wind velocity, etc. from pressure and temperature data obtained during rocket flights to 100 km or so, based on data presented in paper by Dow and Reifman (1946). Effects of various atmospheric constituents, and determination of dissociation by this method also discussed. Effect of projectile is taken into consideration. *Subject Headings:* **1. Rocket measurements 2. Upper atmosphere 3. Dissociation. I. Dow, W. G. II. Reifman, Alfred.**—*M.R.*

3.10–33 551.501.7:551.557:656.7

Primault, B., **Des cartes en altitude et de leur influence sur le calcul des temps de vol.** [Upper level charts and their role in calculation of flight time.] *La Météorologie*, 4th Ser., No. 24:250–258, Oct./Dec. **1951.** 3 figs., 3 tables, 7 refs. French, English and Spanish summaries p. 250. **DWB**—Comparison of 500 mb charts prepared by the French, British and German (US-Zone and British Zone) services for May 27, 1950 shows the extent of difference in results obtained from same data by different analysis centers. Resulting differences in upper winds reported by various centers lead to confusion in flight plans. Suggests elimination of differences arising from diverse types of radiosondes, instructions, transmission and decoding or plotting techniques. Basis of this study is the international radiosonde comparison at Payerne, Switzerland. *Subject Headings:* **1. Upper air charts 2. Upper air winds 3. Flight plans 4. International radiosonde comparisons 5. Aeronautical meteorology.**—*M.R.*

3.10–34 551.501.8:551.594.7(68)

King, J. S. (*Weather Bur., S. Africa*), Hewitt, F. J. (*Telecommunications Research Lab., C.S.I.R. Johannesburg*) and Bozzoli, G. (*Univ. of Witwatersrand, Johannesburg*), **Radio meteorology in southern Africa.** (In: **African Regional Scientific Conference, Johannesburg, Oct. 17–28, 1949.** 2:41–44, **1950.** In English; French summary p. 41.) **DWB**—A discussion of the development of radio meteorology in South Africa, of the use of sferics for detecting thunderstorms and the application of microwave radar for precipitation detection in South Africa. The author discusses also the use of radar for upper wind measurement, the influence of meteorological conditions upon radar waves, the meteorological conditions likely to cause superrefraction, etc. A list of radiosonde stations operating in South Africa is given. *Subject Headings:* **1. Radio meteorology 2. Sferics 3. Radar storm detection 4. South Africa.**—*I.L.D.*

3.10–35 551.501.81:551.578.45

Langille, R. C. and Thain, R. S., **Some quantitative measurements of three-centimeter radar echoes from falling snow.** *Canadian Journal of Physics*, 29(6):482–490, Nov. 1951. 6 figs., 5 refs., equations. **DWB**—Experimental results indicate that fairly accurate calculations of snow echoes are possible by employing Ryde's formula, regardless of the rate of the snowfall or the radar set, taking into consideration the fact that the size distribution of the snowflakes plays an important role in the echo to be expected from a particular snowstorm. *Subject Headings:* **1. Radar storm detection 2. Snow echoes.**—*W. N.*

3.10–36 551.501.81:551.574.1:551.576.11

Wexler, R., **Theory of the radar upper band.** *Royal Meteorological Society, Quarterly Journal*, 78(337):372–376, July 1952. 2 tables, 4 refs., 10 equations. **DWB**—The upper radar band described by Bowen (*see MAB* 2.11–142, Nov. 1951) is attributed to the growth of a layer of tabular crystals into graupel, which depletes the liquid water content below a critical value. The necessary conditions are described. *Subject Headings:* **1. Bright band echoes 2. Radar analysis of precipitation.**—*C.E.P.B.*

3.10–37 551.501.9:551.525.2

Hommel, Karlheinz, **Örtliche Unterschiede bei der Messung von Erdboden-Minimumtemperaturen nach den Beobachtungen am Observatorium Hohenpeissenberg Obb.** [Local differences in readings of grass minimum temperatures from observations at Hohenpeissenberg.] *Meteorologische Rundschau*, 5(3–4):58, March–April 1952. **DWB**—Readings of 6 differently exposed minimum thermometers in April–May 1950 showed differences up to 7.8°C. *Subject Headings:* **1. Instrument exposure 2. Surface temperatures 3. Hohenpeissenberg, Germany.**—*C.E.P.B.*

3.10–38 551.501.1(431/5)

Germany. Deutscher Wetterdienst in der US-Zone, **Anleitung für die Beobachter an den Wetterbeobachtungsstellen des Deutschen Wetterdienstes. Ausgabe für den Klimadienst.** [Instructions for meteorological observers at German stations. Edition for the climatological service.] New rev. 6th ed. Bad Kissingen, 1951. 78 p. diagrs., forms (fold., laid in pocket). **DWB**—Detailed and elegantly presented instructions for the climatological service of the US-Zone weather service. Chapters are provided for each of the following: pressure, temperature, humidity, wind, cloudiness, sunshine, visibility, precipitation, snow, thunderstorms, lightning, auroras, optical phenomena, earth temperature and state of ground, etc. and for entries in daily and monthly logs, and for summarization. Instruments and forms are illustrated and codes, conversion tables and references to German literature, handbooks, tables and climatic atlases which would aid the observer are given. Two new hair hygrometers are described (Fuess and Lambrecht). The sections on sunshine, mountain rain gages, soil temperature, visibility, precipitation and snow cover are revised and amplified. A good subject index is added. Many additions and changes have been made in this edition as compared with the pre-war (5th) edition. *Subject Headings:* **1. Observers manuals 2. Instruction for observers 3. German Meteorological Service (U. S. Zone).**—*M.R.*

OBSERVATIONAL DATA

(*See also items:* 3.10–17 to 3.10–21)

3.10–39 551.506.1:551.509.21(82

§Argentina. Servicio Meteorológico Nacional, **Cincuentenario de la carta del tiempo 1902–1952.** [Fiftieth anniversary of the weather map, 1902–1952.] [Dec. 1951.] 7 p. map, chart. **DWB**—"Carta del Tiempo" is the title of the daily weather bulletin issued by the National Meteorological Service of Argentina at Buenos Aires at 1700 h (based on 0900 h observations for over 250 stations (33 aerological) from La Quiaca to General San Martin (22°N–68°S and from sea level to 4250 m elevation. The evolution of the bulletin from its small beginning to its present multicolor form is outlined year by year and the various features of the current publications given in detail with reproduction of a current chart (Nov. 12, 1950

and the one for Feb. 21, 1952. Extreme data for Argentina are also given. *Subject Headings:* 1. Synoptic charts 2. Daily weather bulletins 3. Climatic extremes 4. Argentina.—*M.P.*

3.10–40 551.506.1:551.557(493)

*Belgium. Institut Royal Météorologique and Belgium. Régie des Voies Aériennes. Service Météorologique d'Aviation. Observations du réseau synoptique belge. [Observations of the Belgian synoptic network.] Jan. 1949. tables. In French and Dutch. DWB—Actual (real) synoptic observations for 12 stations in the two meteorological services of Belgium (Institut Royal Météorologique and Service Météorologique de la Régie des Voies Aériennes) for 00, 03, 06, 09, 12, 15, 18 and 21h are listed for each day of each month in these monthly data publications. Pilot balloon observations for 4 times each day at Uccle and radiosonde observations for 5 stations for a number of days each month are given. *Subject Headings:* 1. Synoptic observation 2. Upper air wind data 3. Monthly summaries 4. Belgium.—*M.P.*

3.10–41 551.506.1(497.2)

Bulgaria. Tsentralno Meteorologicheska Stantsiya, Sofia. Meteorologichen godishnik, godini 1934–1938. [Meteorological yearbook 1934–1938.] Sofia, "Georgi Dimitrov," 1950. 397 p. chiefly tables. In Bulgarian and French. DLC—For each year from 1934 through 1938 numerous tables are given, including list of stations (coordinates, institution making observations, and type of station), detailed monthly and annual data for usual elements for >100 stations in Bulgaria, rainfall data for >250 stations, mean 5-day temperature for 16 or 17 stations, monthly and annual mean monthly and annual temperature for >100 stations, monthly and annual precipitation >100 stations, number of days with precipitation of 10 and 25 mm or greater and changes in network during the year. *Subject Headings:* 1. Yearbooks 2. Climatic data 3. Meteorological networks 4. Bulgarian language 5. Bulgaria.—*M.P.*

3.10–42 551.506.1:656.71(711)

*Canada. Meteorological Division. Annual meteorological summary for Vancouver Airport, B.C., 1951. Vancouver Airport, B.C., Meteorological Office [1952]. 29 p. mostly tables. DWB—History of observations and airport stations reviewed. The airport averages 19 inches a year of precipitation less than the downtown area and 90 inches less than the hills just to the north. Thus records cannot be combined for different sites even in a small area. Instrumentation, local influences, general climatic features, weather of year and of each separate month of 1951, annual monthly and annual data, daily mean maximum and minimum temperatures, precipitation, snowfall and long term averages of temperature, precipitation, humidity, degree days and daily extremes and actual monthly values for all elements named above (1937–1951), including wind speed and sunshine for Vancouver Airport. *Subject Headings:* 1. Climatic data 2. Annual summaries 3. Airport observation 4. Vancouver, B.C.—*M.R.*

3.10–43 551.506.1(489,491,988) 551.526.6

*Denmark. Meteorologisk Institut. Meteorologisk Årbog, 1943. 2ème Partie. Le Groenland. [Meteorological Yearbook, 1943. Pt. 2. Greenland.] 57 p. Meteorologisk Årbog, 1940–45. Tillaeg Til 1 ste Del: Faerøerne. [Meteorological yearbook, 1940–45. Addendum to Part 1: Faroe Islands.] 80 p.; Meteorologisk Årbog, 1950. 1 ste Del: Danmark (Untagen Grønland). [Meteorological yearbook, 1950. Part 1: Denmark with the exception of Greenland.] 114 p. *Denmark. Meteorologisk Journal. Publikationer* [unnumbered] 1951. entirely tables. In Danish and French. DWB—These yearbooks are issued in 3 parts: 1) for Denmark, 1950, containing original daily observations for 18 first order stations, monthly summaries for 42 first and second stations and annual summaries of monthly temperature and precipitation for numerous 3rd order stations; 2) for Greenland, 1943, with daily values for 7 stations, monthly and annual summaries for 15 stations and 3) for the Faroe Islands, 1940–45, including daily values for Hojvig, monthly and annual summaries for Hojvig and Myggenaes, and special tables of sea surface temperature (1930–49) and sunshine duration (1921–45) and precipitation (1931–50) for Myggenaes, Hojvig and Klaksvig, respectively. *Subject Headings:* 1. Observational data 2. Yearbooks 3. Marine meteorological data 4. Sea surface temperatures 5. Denmark 6. Greenland 7. Faroe Islands.—*M.P.*

3.10–44 551.506.1:551.46(26)(489)

Denmark. Meteorologisk Institut, **Nautisk-Meteorologisk Årbog, 1935, II. Del Meteorologiske observationer.** [Marine meteorological yearbook, 1935, II. Meteorological observations.] *Denmark. Meteorologisk Institut, Publikationer* [unnumbered] **1950.** 72 p. entirely tables. In Danish and English. **Nautisk Meteorologisk Årbog, 1950.** [Nautical meteorological yearbook, 1950.] *Denmark. Meteorologisk Institut, Publikationer* [unnumbered] **1951.** 165 p. mostly tables, charts. In Danish and English. **DWB**—*Subject Headings:* **1. Observational data 2. Marine meteorology 3. Yearbooks 4. Denmark.**

3.10–45 551.506.1(431/5) 551.506.7

*Germany. Deutscher Wetterdienst in der US-Zone, **Deutsches Meteorologisches Jahrbuch, US-Zone, 1949.** [German meteorological yearbook, US-Zone, 1949.] Bad Kissingen, **1951.** 176 p. 5 charts, mostly tables. **DWB**—Extensive tables of daily meteorological and phenological observation at 44 first order and many second and third order stations, monthly and annual means and extremes, precipitation observations for 1500 stations and summary of activities with respect to pilot balloon and radiosonde ascents at Erlangen, Berlin-Tempelhof, Munich and Wiesbaden. Visibility, sunshine and soil temperatures (17 stations) and frost data are tabulated separately. A station location chart and several nice phenological charts are included. *Subject Headings:* **1. Observational data 2. Yearbooks 3. Phenological observations 4. Climate of Germany 5. Germany (US-Zone).**—*M.R.*

3.10–46 551.506.1(43) 551.506.7(43)

*Germany. Meteorologisches Amt für Nordwestdeutschland, **Deutsches Meteorologisches Jahrbuch, Britische Zone, 1950, Teil 1/3.** [German Meteorological Yearbook, British Zone, 1950, Part 1/3.] Hamburg, **1951.** 288 p. mostly tables. **DWB**—A substantial volume containing summary of weather conditions and usual daily, monthly and annual meteorological data for synoptic observation stations (thrice-daily), for climatological stations (daily) and precipitation stations (daily). Daily snow depth and water content of snow; hourly values of meteorological elements wherever recording instruments are in use; extreme values of precipitation and frequencies of various amounts; phenological records; sunshine duration, soil temperature (24 stations at 4 depths); and upper air temperature, height, R.H., and wind for standard pressure surfaces and for tropopause at 4 stations in British zone. *Subject Headings:* **1. Observational data 2. Upper air data 3. Phenological data 4. Soil temperature data 5. Yearbooks 6. Germany (British Zone).**—*M.R.*

3.10–47 551.506.1:551.579:551.577.3(458)

*Italy. Ufficio Idrografico della Sicilia Palermo, **Annali idrologici, 1941, parte prima** [Hydrologic yearbook, 1941, Part I.] **1951.** 230 p. map, entirely tables. *Ibid.*, . . . **1946 1951.** 71 p. 33 figs., map, tables. **DWB**—Included in section A of the 1941 report are temperature tables giving diurnal values, means, extremes, frequencies and variations. Section B consists of precipitation tables, subdivided to show diurnal and seasonal values (intensity and periodicity of rainfall) and snow cover. The 1946 report is extended to include tables identical to those described for 1941 plus data pertaining to frequency of hydrometeors and the hydrological balance in certain selected ports. Pt. II for 1941 and yearbooks for 1942–1945 have not been published. *Subject Headings:* **1. Hydrology 2. Temperature variations 3. Precipitation variations 4. Hydrologic cycle 5. Annual reports 6. Sicily. I. Abbadessa, Francesco** (*ed.*).—*M.P.K.*

3.10–48 551.506.1(698.2) 550.3

*Mauritius. Royal Alfred Observatory, **Results of magnetical and meteorological observations,** 34(1–12), Jan.–Dec. **1948.** Port Louis, Government Printer, Jan.–Nov. **1951.** 12 pieces. all tables. **DWB**—This monthly report contains hourly, 3-hourly, 6-hourly and daily values of magnetic and meteorological elements observed or recorded at the Royal Alfred Observatory, Mauritius, and the surface and upper air observations made each day at the aerological station at Vacoas. Hourly values of pressure, temperature, cloud amount, sunshine duration, wet bulb depression, wind speed and precipitation are given. Pilot balloon observations for 1, 2, 3, 5, 7, 10, 15, 20 and 25 thousand feet are tabulated for each day. I

addition, monthly total rainfall and normals for over 80 stations (by districts) in Mauritius are given. *Subject Headings:* **1. Monthly summaries 2. Observational data 3. Magnetic data 4. Upper air data 5. Royal Alfred Observatory, Mauritius. I. McCurdy, N. W.** *(ed.).—M.R.*

3.10–49 551.506.1(492)

*Netherlands. (K.) Meteorologisch Instituut, **Jaarboek, A, Meteorologie, 1949.** [Yearbook, A, Meteorology, 1949.] *Netherlands. (K.) Meteorologisch Instituut,* No. 97, **1951.** 94 p. entirely data. In Dutch and French. Price: f 5.00. **DWB**—Stations in the network are listed with date of inauguration. Hourly observations of pressure, temperature, wind and sunshine at De Bilt, Den Helder, Vlissingen, Groningen and Maastricht; thrice-daily observations of other elements at the same stations and summaries of all types of observations at 37 stations are tabulated by months and for the year. The introduction explains the methods of observation and tabulation in detail in both Dutch and French. Data for rainfall stations have been omitted and are published in a separate report. *Subject Headings:* **1. Observational data 2. Climatic data 3. Yearbooks 4. Netherlands. I. Deij, L. J. L.** *(ed.).—M.R.*

3.10–50 551.506.2(41/2):551.515.1:551.577.51

§Sawyer, J. S., **A study of the rainfall of two synoptic situations.** *Royal Meteorological Society, Quarterly Journal,* 78(336):231–246, April **1952.** 11 figs., table, 5 refs. **DWB**—On March 14, 1949, a small depression moved quickly E.S.E. across the British Isles. Distribution of rate and amount of rainfall, isochrones of front and rear edges and of rain from a trailing occlusion are shown. The warm front rain of Feb. 14, 1950, is similarly analyzed. In both these cases of steady rain, it is found that distribution can be analyzed into an orographic component and one based on SUTCLIFFE's expression for cyclonic development. *Subject Headings:* **1. Rainfall distribution 2. Synoptic analysis 3. British Isles.**—*C.E.P.B.*

INSTRUMENTS AND INSTRUMENT CARRIERS

(*See also items:* 3.10–32, 3.10–105, 3.10–140, 3.10–142, 3.10–149, 3.10–177)

3.10–51 551.507.321.2

Hinzpeter, Max, **Zur Aerodynamik des Radiosondeaufstieges.** [On the aerodynamics of radiosonde ascents.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:150–154, **1952.** 4 figs., 2 tables, 8 equations, 5 refs. **MH-BH**—The resistance of an ascending balloon and tetrahedral radar reflector is calculated and compared with measurements of upward velocity. Deviations are small and normally distributed. *Subject Headings:* **1. Balloon research 2. Radiosonde ascents.**—*C.E.P.B.*

3.10–52 551.507.321.2

Meurers, Joseph, **Zur Aerodynamik der Pilotballone.** [On the aerodynamics of pilot balloons.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:143–149, **1952.** 9 figs. **MH-BH**—A statistical investigation of distribution of vertical velocities of pilot balloons (2 theodolites) at Lindenberg showed that velocities more often exceeded than fell short of calculated velocities, especially in medium heights with slowly rising balloons. The cause is not clear. *Subject Headings:* **1. Balloon research 2. Lindenberg, Germany.**—*C.E.P.B.*

3.10–53 551.507.362:551.508.96

Jackson, John E., **Upper atmosphere research report, No. XIII, Rocket-borne instrumentation for ionosphere propagation experiments.** *U. S. Naval Research Laboratory, Report* No. 3909, Jan. 9, **1952.** 39 p. graphs, diagrs., photos., refs. **DWB**—Based on work done since 1946 (when the Rocket Sonde Research Branch of NRL began studying the ionosphere by means of instruments installed in rockets), improvements have been made to overcome technical problems. This report describes various V-2 and Viking flights (1947–1950) conducted in New Mexico and the instrumentation, transmitters, antennas, tuning units, records, performance, etc. are described and illustrated with detailed wiring diagrams. Appendix gives details for calculations of antenna impedances from telemetering data. *Subject Headings:*

1. Rocket instrumentation 2. V-2 rockets 3. Martin Viking rockets 4. Ionospheric resear 5. White Sands, New Mexico. I. U. S. Naval Research Laboratory. Upper Atmosphe Research.—*M.R.*

3.10–54 551.508.21:551.501.1(

Hand, Irving F., **Pyrheliometers and pyrheliometric measurements.** Washington, D. C U. S. Weather Bureau, Nov. 1946. 55 p. photos., tables, refs. **DLC**—After a brief descri tion of the several types of instruments used for measuring solar (direct), total and sky radi tion, and the recording device (Leeds & Northrup) used by the U.S.W.B., there is a secti on standardization of pyrheliometers and another on calculation of air masses at differe stations and solar altitudes (hour angle, altitude, latitude and declination interpolation sunrise, sunset and twilight, including 20 pages of tables for calculating the above, and complete list and description of each of about 40 stations in North America with elevatio type of instrument and recorder, coordinates and exposure. Instruments used by Weath Bureau are shown in large photographs. *Subject Headings:* **1. Actinometry 2. Pyrheliomete 3. Solar radiation networks 4. Manuals 5. North America. I. U. S. Weather Bureau.**—*M.*

3.10–55 551.508.

Hinzpeter, Hans, **Bericht über neuere Arbeiten zum Solarimeter nach Gorczyńs** [Report on new work on the Gorczyński solarimeter.] *Zeitschrift für Meteorologie*, 6(4):11 121, April 1952. 3 figs., 2 tables, 3 refs. **MH-BH**—Describes developments of Gorczyńs solarimeter (Kipp & Sons) into a universal and more accurate instrument. P. Bener h investigated the standardization factor; apparatus illustrated. Use of hydrogen instead air to fill the instrument makes it independent of temperature but decreases sensitivi Tables are given for temperature correction and percentage error for different azimuths a angles of incidence or sun's heights. *Subject Headings:* **1. Pyrheliometers 2. Solarimete** —*C.E.P.B.*

3.10–56 551.508.26 53(

British Standards Institution, London, **Meteorological thermometers.** *British Standa Institution*, [*Report*] No. 692, 1951. 16 p. 4 figs., 2 tables. **GB-MO**—The pamphlet s out the specifications of maximum (mercury in glass), minimum (spirit in glass) and ordina thermometers developed by the British Meteorological Office for world-wide use. Plates sh arrangement and suspension in screens. *Subject Heading.* **1. Thermometers.**—*C.E.P.B.*

3.10–57 551.508.26(09):06(

†Patterson, Louise Diehl, **Thermometers of the Royal Society, 1663–1768.** *Americ Journal of Physics*, 19(9):523–535, Dec. 1951. 7 figs., 67 refs. **DLC**—An excellent summa of the advances in thermometry made in England by members of the Royal Society such Robert Hooke, and later by Francis Hauksbee the Younger between 1663 and the ea 18th century when Wolff (1714), Romer (1702), Fahrenheit (1708–1717) and Celsius (17 made better thermometer scales. The several types of scales used are described in detail a illustrated and an account given of various series of observations made in London, Edinbu and elsewhere with these various thermometers or scales. The Gresham College stand thermometer was used from 1665–1709 in calibrating other instruments used by the c tributors to the Royal Society's "History of the weather" (in many countries) and the s of its scale greatly influenced later scales which all have a ratio of 9:5 or 4 with the Ro Society unit. Use in interpretation of barometric records of 17th century is also stress *Subject Headings:* **1. Thermometers 2. Thermometer scales 3. History of meteorologi instruments. I. Hooke, Robert II. Boyle, Robert.**—*M.R.*

3.10–58 551.508

Smirnov, V. A., **Fotoregistriruiushchiĭ termometer M. I. Gol'tsmana i A. A. Znamensko** [Photorecording thermometer of M. I. Gol'tsman and A. A. Znamenskii.] (In: Leningr Agrogidrometeorologicheskii Institut, **Materialy po agroclimaticheskomu raionirovan subtropicov SSSR.** [Materials on the agro-climatic classification of the subtropics in USSR.] **1938.** Vol. 2. p. 112–114. 3 refs.) **DLC**—Detailed description and a schem

drawing of a photorecording thermometer for use in microclimatic surveys. Results obtained by the first test made on an automobile trip are shown graphically. *Subject Headings:* **1. Thermometers 2. Recording equipment.**—*N.S.*

3.10–59 551.508.29:551.525.4

Lehmann, Paul, **Ein Integrator für Wärmeumsatzmessungen im Boden.** [An integrator for measurements of heat economy in the ground.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 35:304–306, **1952.** 2 figs., 5 refs. **MH-BH**—Describes a technique of obtaining earth temperatures in the field with an electrical apparatus by W. Schmidt. *Subject Heading:* **1. Soil temperature measurement techniques.**—*C.E.P.B.*

3.10–60 551.508.29:551.526.6

Roll, Hans-Ulrich, **Wassertemperaturmessungen an Deck und im Maschinenraum.** [Water temperature measurements on deck and in the engine room.] *Annalen der Meteorologie*, 4 10–12):439–443, **1951.** 5 figs., 3 refs. German and English summaries p. 439. **Zur Genauigkeit der Wassertemperaturmessung mit dem Wasserschöpfthermometer (Marine-Pütz.** [On the accuracy of water temperature measurement with the water-scoop thermometer, "Marine-pütz."] *Ibid.*, p. 480–482. 2 figs., table, 3 equations, 2 refs. Gödecke, Karl, **Die Marine-Pütz mit Wasserthermometer.** [The marine water scoop with water thermometer.] *Ibid.*, p. 479. fig. **DWB**—Comparative observations in the North Sea were made on deck with a "water-scoop" with built-in thermometer and in the engine room in a copper tube drawing a stream of water from a depth of 4.5 m. The difference was less than ±0.3°C in 73.5% of 410 measurements. Deck minus engine room was increasingly negative with winds above Beaufort 4 due to loss of heat on deck by heat exchange and evaporation, and a correction was calculated which reduced mean error to ±0.12°C. This source of error is further discussed in the second paper on the basis of wind tunnel experiments. The "water-scoop" is described and illustrated by Karl Gödecke; it consists of an insulated bronze scoop, rubber bellows, a highly polished case and a precision thermometer. *Subject Headings:* **1. Temperature instruments 2. Sea temperatures. I. Gödecke, Karl.**—*C.E.P.B.*

3.10–61 551.508.5

Ower, Ernest, **The measurements of air flow.** London, Chapman & Hall, **1949.** 3rd ed. rev. Price: 30 s. 293 p. 100 figs., 21 tables, refs. throughout. Review by M. A. G. Rau, in *Journal of Scientific and Industrial Research*, 10(1):28–29, Jan. **1951. DWB**—First published in 1927, this text has been twice revised. The third edition is a much more thorough revision than the second, and is not confined mainly to the author's own work as were the first two. In the introductory chapter the cup, plate and hot wire anemometers are mentioned as being of more use in meteorological than in industrial measurements. Chap. II (p. 6–17) gives details of theory, calibration and operation of pressure-tube anemometers, Chap. VII. Vane anemometers, Chap. IX. Manometers and Chap. X. Hot wire anemometers and katathermometers. Other chapters deal with Pitot tubes, flow of air in pipes, Venturi tubes, etc. *Subject Headings:* **1. Anemometers. I. Rau, M. A. G.**—*M.R.*

3.10–62 551.508.822:06

International Meteorological Organization. Joint Subcommission for Experimental Aerology, **État d'avancement du dépouillement des expériences pour la comparaison mondiale des radiosondes à Payerne, 1950, par la Délégation suisse.** [Status of analysis of international comparisons of radiosondes at Payerne in 1950 by the Swiss delegation.] Zurich, Nov. 6, **1950.** 21 p. graphs, tables. Mimeographed. **DWB**—Tables, graphs and forms are included, showing methods of analysis and results (divided into two sections, one for the synoptic meteorologist and one for the observer or instrument technologist). *Subject Headings:* **1. Radiosonde comparisons 2. Swiss radiosonde 3. Payerne, Switzerland. I. Lugeon, Jean II. Ackermann, Paul.**—*M.R.*

3.10–63 551.508.822

*International Meteorological Organization. Joint Subcommission for Experimental Aerology [and] Subcommission for the Comparison of Radiosondes, **Comparaison mondiale**

des radiosondes; acte final de la première expérience à la Station Aérologique de Payerne-Suisse, 8 au 30 mai, 1950. [World comparison of radiosondes made at the Aerological Station at Payerne, Switzerland, May 8–30, 1950.] v. 1 and 2, Feb. **1951.** tables. Mimeographed. **DWB**—Representatives of 9 countries sent 7 types of radiosonde equipment and necessary operating personnel to Payerne, Switzerland in May 1950 for the purpose of making systematic comparisons of the various types under similar atmospheric conditions. Finland, Sweden, Norway, Netherlands, Belgium, France, Great Britain, U.S.A., U.S. Zone of Germany, and Switzerland cooperated in this project which had been recommended by the CIMO at Toronto in 1947. Results are given in these two volumes in great detail. Successive or tandem releases of 2, 3, 4, 5 or 6 radiosondes of various types, with simultaneous reception at 6 stations, gave comparative data which have been partially summarized in these reports. The IMO resolution which concerned this project, members of the sub-commission, list of participants from the several countries, description of each type of radiosonde, plan of site where equipment was installed, forms used in recording and computing, list of times of releases with pressure at Jungfraujoch at time of release, and differences in pressure, temperature and altitude between different kinds of radiosondes for various levels up to 30 km are given in Vol. I. Vol. II contains summaries of differences between instruments of various types, or errors in any given type, for the benefit of synoptic analysts and forecasters. Means of differences in altitude of pressure surfaces are in general $<1\%$ and seldom $>1.5\%$. Relative humidity varies by as much as 20% between types of sondes. A chart for North Atlantic and Europe for 500 mb level (May 27, 1950) shows difference in analyses of 4 countries, comparatively. *Subject Headings:* **1. Radiosonde comparisons 2. Radiosonde errors 3. Payerne, Switzerland I. Payerne. Station Aérologique II. IMO. Subcommission for the Comparison of Radiosondes.**—*M.R.*

3.10–64 551.508.822:551.557.3

Jones, E. E., Hooper, J. E. N. and Adler, N. L., **The radar-sonde system for the measurement of upper wind and air data.** *Institution of Electrical Engineers, London, Proceedings*, 98 Pt. II (64):461–469, Aug. **1951.** 11 figs., table, 10 refs. **DWB**—It is claimed that this new system of determining upper air wind direction and speed, and of telemetering temperature pressure and humidity aloft to a slant range of 100 miles, is 10 times as accurate as previous instruments. Deficiencies in the older systems in use in Europe and America, the general ideas and details of the new instrument and receiver, and the wind computer are described and illustrated. The equipment has been developed by the Physics Dept. of the Telecommunications Research Establishment of Great Britain. Wind as well as other elements are measured from pulses sent out by the radiosonde. All working parts which would be affected adversely by temperature changes are well insulated. All recording is automatic. *Subject Headings* **1. Radarsondes 2. Upper air wind measurement 3. Radiosondes.**—*M.R.*

3.10–65 551.508.82

Müller, Hans Gerhard, **Ein neues elektrisches Höhenwindmessverfahren.** [A new electrical method of measuring upper air wind.] *Germany. Reichsamt für Wetterdienst, Forschungs- und Erfahrungsberichte, Ser. B*, No. 20, **1944.** 16 p. diagrs., graphs, tables, 7 refs. Photostat. **DWB**—A method (similar to that now called rawinsonde) of tracking pilot balloons which is superior to single and more efficient than double theodolite optical methods, or double (triangulation) electric locating methods, is described in detail, its accuracy determined and examples of wind aloft measurements by this method given. Equipment, recordings and calibration are described and illustrated. Two types of apparatus are used: 1) with the balloon carrying a target and 2) carrying a relay. *Subject Headings:* **1. Radiowind soundings 2. Upper air wind measurement.**—*M.R.*

3.10–66 551.508.82

Perlat, A., **La comparaison internationale des radio-sondes.** [The international radiosonde comparison.] *Journal Scientifique de la Météorologie*, 3(12):124–130, Oct./Dec. **1951.** tables, equations, refs. French, English and Spanish summaries p. 124. **MH-BH**—Six types of radiosondes were compared during May 1950 at Payerne, Switzerland, and the results are presented in tables and discussed. In 95% of the cases the difference between the results a

any given level did not exceed: a) 15 mb, 3°C, 20% relative humidity (at 700 mb) and b) 1.5% of the altitude at any given pressure. Significance of errors for synoptic analysis is discussed. *Subject Headings:* **1. Radiosonde comparisons 2. Radiosonde errors 3. Payerne, Switzerland.** —*M.R.*

3.10–67 551.508.822

Werner, J., **Radiosondehöhen und temperaturbedingte Druckdosenkorrektionen im Spiegel gleichzeitiger Radarmessungen.** [Radiosonde heights and temperature corrections to the pressure element in the light of simultaneous radar measurements.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:320–322, **1952. MH-BH**—Differences radiosonde-radar after applying various corrections ranged from about −0.14 to +0.51 mb at 500 mb and +1.00 to +2.10 mb at 200 mb. The cause is not clear. Humidity correction is especially considered. *Subject Heading:* **1. Radiosonde calibration.**—*C.E.P.B.*

3.10–68 551.508.91:551.574.1

Soudain, G. (*Étab. d'Études et de Rech. Mét., Trappes*), **Réalisation d'un compteur automatique de noyaux de chlorure de sodium.** [Construction of an automatic counter for sodium chloride nuclei.] *Journal Scientifique de la Météorologie*, 3(12):137–142, Oct./Dec. **1951.** 5 figs., equations, 4 refs. French, English and Spanish summaries p. 137. **MH-BH**—Based on a principle suggested by Findeisen (1939), the author has constructed a device which will register the number of Na^+ ions in a given sample of air. It is assumed that most of the Na ions are due to NaCl, so the results would give the number of saline nuclei in the atmosphere which is sampled. The apparatus consists of an enclosed bunsen burner into whose flame the air is drawn, protective devices to prevent contamination from other sources, a projecting lens, a light filter, a photoelectric cell, an amplifier and a recorder. The system can record up to 6 impulses a second, thus enabling it to analyze 350 cc of air per sec. It cannot detect particles of $NaCl > 10^{-4}$ cm. Because of heating in the photoelectric cell, the device can be operated only 15 min per hour. Results of 3 months of operation at Trappes, France are summarized and sample records shown. Interesting discoveries were: 1) extreme variability in count from one minute to the next (due to turbulence) and 2) diminution of number of saline particles during high humidity or precipitation. A maximum number was frequently observed between 15^h and 18^h, and between 23^h and 02^h. Effect of air masses or sea breezes has not yet been analyzed. Apparatus and recording circuits are shown by line drawings. *Subject Headings:* **1. Nuclei counters 2. Saline nuclei 3. Cloud physics 4. Trappes, France.**—*M.R.*

3.10–69 551.508.95:551.510.41

U. S. Office of Naval Research, **Improved apparatus for analysis of the atmosphere.** *U. S. Office of Naval Research, London, European Scientific Notes*, 5(1):1–12, Jan. 1, **1951. DWB**—Improved apparatus for measuring very small amounts of inert gases, making use of principle of differential absorption of neon and helium on charcoal. To be used in analysis of samples collected by V-2 rockets (by Univ. of Michigan Engineering Dept.). Results to date indicate little variation in composition of the atmosphere up to 70 km as mixing due to turbulence and winds predominates over diffusive separation. *Subject Headings:* **1. Atmospheric composition 2. Air sampling and analysis.**—*M.R.*

3.10–70 551.508.952 551.510.41:546.214

Ehmert, Alfred, **Gleichzeitige Messungen des Ozongehaltes bodennaher Luft an mehreren Stationen mit einem einfachen absoluten Verfahren.** [Simultaneous measurements of the ozone content of the air near the earth at several stations by means of a simple absolute method.] *Journal of Atmospheric and Terrestrial Physics*, London, 2(3):189–195, **1952.** 11 figs., 7 refs., equations. English summary p. 189. **DWB**—Observations were taken at several stations around Weissenau, including Arosa, with a simple accurate electrical iodine apparatus, which is described and illustrated. Series characteristic of different weather types are compared graphically. They show the rapid destruction of ozone near the ground, especially in town haze with combustion gases, and renewal from above. *Subject Headings:* **1. Ozone measurement techniques 2. Ozone meters.**—*C.E.P.B.*

3.10–71 551.508.952

*Tcheng, Mao-lin, **Mesures de la quantité d'ozone contenue dans l'atmosphère par spectrophotométrie photographique du ciel bleu au zénith.** [Measurements of the amount of ozone contained in the atmosphere by photographic spectrophotometry of the zenith blue sky.] *Annales de Géophysique*, 7(1):45–58, Jan.–March **1951.** 10 figs., 4 tables, 13 refs. French and English summaries p. 45. **MH-BH**—The Götz quartz spectrograph, used to determine the depth of the ozone layer from the shortest observed wave length when pointing the instrument at the sun, is tested for use by pointing at the zenith during clear weather. The observations presented in detailed tables and graphs were made at Arosa from Feb.–May, 1950. One hundred 5-minute observations were selected for analysis on the microphotometer at the Lyon Observatory. The slopes of the times of observations on log paper are not parallel for different days—hence, the author concludes that the method is not completely applicable to zenith blue sky measurements. Measurements were made by Götz on the same days with a Dobson spectrophotometer. The results of the plotting of data obtained by the two methods show a fair correlation which allows a variable correction to be applied to the wave length, depending on the depth of the ozone layer. Later observations made by the spectrophotometric method, and calculation by the Dufay method, give values which agree better with the Dobson instrument measurements. The *umkehr* effect of Götz is considered in analyzing the comparative intensity of two radiations. Coefficients obtained by several authors are compared graphically with a theoretical curve for the wave lengths from 3025 to 3175 Å. *Subject Headings:* **1. Ozone measurement techniques 2. Ozone data 3. Spectroscopy 4. Umkehr effect 5. Arosa, Switzerland.**—*M.R.*

SYNOPTIC ANALYSIS AND FORECASTING

(*See also items:* 3.10–1, 3.10–11, 3.10–18, 3.10–19, 3.10–39, 3.10–156, 3.10–193, 3.10–209, 3.10–223, 3.10–252, 3.10–267)

3.10–72 551.509.3:551.513

†Flohn, Hermann, **Probleme der grossräumigen Synoptik.** [Problems of large scale synoptics.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:12–23, **1952.** 9 figs., 6 tables, 56 refs. **MH-BH**—This collection of basic geographical and statistical data on world synoptics includes mean position and limits of frontal zones and high level troughs, and analogies between atmosphere, oceans and rivers, formation of cyclones and anticyclones from upper currents and their subsequent history, jet streams, blocking anticyclones, meridional and zonal circulation, etc. Several vertical sections are given. The summary ends with some remarks on long range forecasting. *Subject Headings:* **1. Synoptic studies 2. General circulation.**—*C.E.P.B.*

3.10–73 551.509.3

†Sutcliffe, R. C., **Reviews of modern meteorology—6. Principles of synoptic weather forecasting.** *Royal Meteorological Society, Quarterly Journal*, 78(337):291–320, July **1952.** 61 refs. **DWB**—The synoptic problem is formulated as the determination of the evolution of the field distribution of physical properties of the atmosphere, and the superposition on this of a fine structure in space and time. Synoptic cartography of a 3-dimensional model is examined, then the pressure-wind and pressure-temperature-wind relations, air masses and fronts. The various methods of forecasting the pressure and contour fields are examined—extrapolation, synoptic models, analogs, statistics, numerical solutions. Forecasting the synoptic fine structure includes the consideration of vertical instability and its analysis and surface boundary conditions—turbulence, diurnal variations of surface conditions, low cloud and fog. Finally, probable developments of synoptic forecasting are discussed conservatively, with emphasis on the inherent limitations to the possibilities of weather forecasting. *Subject Heading:* **1. Forecasting techniques.**—*C.E.P.B.*

3.10–74 551.509.311:551.515.73

§Walden, Hans, **Verhalten stationärer Hochdruckgebiete bei Annäherung einer wandernden Hochzelle.** [Behavior of a stationary high pressure area on the approach of a moving

anticyclone.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:36–42, **1952.** 6 figs., 3 tables. **MH-BH**—When a moving anticyclone approaches a stationary one: 1) they generally combine; 2) the stationary one breaks up; 3) it moves away in a different direction. In a few cases the moving anticyclone passes through the stationary one and continues its path. Examples are shown and the signs (mainly relative and absolute 500 mb topography) discussed. *Subject Heading:* **1. Anticyclones.**—*C.E.P.B.*

3.10–75 551.509.312:551.509.317

Regula, Walter, **Berechnung eines Advektionsmasstabes.** [Calculation of an advection scale.] *Meteorologische Rundschau*, 5(3–4):48–50, Mar.–April **1952.** 5 figs., 2 equations. German and English summaries p. 48. **DWB**—A scale is computed for quantitative determination of the advective change of the relative topography 500–1000 mb. This can be applied to a solenoid chart of surface pressure and relative topography to find the advective pressure tendency. The method is described with example of Dec. 28, 1951. *Subject Heading:* **1. Isallobaric analysis.**—*C.E.P.B.*

3.10–76 551.509.312

Sawyer, John Stanley and Bushby, F. H., **A baroclinic model atmosphere suitable for numerical integration.** *Great Britain. Meteorological Research Committee, MRP* 715, 27 Feb. **1952.** 10 p. 31 equations, 11 refs. **DWB**—Authors adopt as a model a baroclinic fluid in which the thermal wind is constant in any vertical column and its speed is proportional to the vertical pressure difference through the layer. With certain assumptions a system of 3 simultaneous differential equations is derived to compute the rates of change of height of a contour surface, thickness 1000 mb to that surface, and average vertical velocity throughout the column. A method of solution is given but to forecast values 24 hours ahead would be very laborious without electronic computing machinery. *Subject Heading:* **1. Differential kinematics.**—*C.E.P.B.*

3.10–77 551.509.312

§Seilkopf, Heinrich, **Modelle der atmosphärischen Grosszirkulation.** [Model of the large scale atmospheric circulation.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:68–71, **1952.** 7 figs., 8 refs. **MH-BH**—Three dimensional models are constructed of jet stream, upper trough (above warm sector, in circumpolar circulation, with frontal zones) and European monsoon. *Subject Heading:* **1. Synoptic dynamic meteorology.**—*C.E.P.B.*

3.10–78 551.509.318

Hess, Paul, **Der Katalog der Grosswetterlagen Europas; Einführung und erste Zirkulationsuntersuchungen.** [The catalog of the broad-weather situations of Europe: Introduction and the first circulation investigations.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:42–48, **1952.** 4 figs., table. **MH-BH**—Broad weather types (mid-Atlantic to Urals) 1881–1950 are discussed statistically and smoothed daily frequency curves drawn for 10 main types. These show marked peaks and valleys which probably indicate rhythms or type successions in the circulation. The uses of such a catalog are described. *Subject Heading:* **1. Weather types.**—*C.E.P.B.*

3.10–79 551.509.33:551.543

Cappel, A., **Isoplethendarstellung des Luftdrucks als Hilfsmittel für die Diagnose räumlicher und zeitlicher Witterungszusammenhänge.** [Isopleth representation of pressure as an aid in diagnosis of spatial and temporal weather relations.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:26–33, **1952.** 8 figs., table, 11 refs. **MH-BH**—Author describes a method of studying pressure sequences by isolines of pressure along a given line of latitude on successive days. Some examples and related surface charts are given; it is suggested that the method may be useful in extended forecasting. *Subject Headings:* **1. Extended forecasting 2. Pressure anomalies.**—*C.E.P.B.*

3.10–80 551.509.33:551.509.311

§Maletzke, R., **Die Mittelfristvorhersage der Vb-Zyklone, eine grossraumsynoptische Aufgabe.** [Medium range forecasting of Vb cyclones, a large-scale synoptic problem.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:62–67, **1952.** 8 figs. **MH-BH**—From Historical Weather Maps, April and May, the synoptic conditions necessary for a Vb (Genoa) cyclone are set out in detail and illustrated by typical charts. These make forecasts several days ahead practicable. *Subject Headings:* **1. Extended forecasting 2. Cyclone forecasting.**—*C.E.P.B.*

3.10–81 551.509.33

Mildner, Paul, **Über Langfristprognosen.** [On long range forecasts.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35: 56–62, **1952.** 5 figs., 2 tables, 5 refs. **MH-BH**—A discussion of long range forecasting by symmetry points and synoptic similarities (steering types and circulation). Monthly forecasts were begun at Rhine-Main in spring 1949 and were very successful in 1951 when an exceptionally good symmetry point occurred on July 9 (results set out in detail). From Sept. 7–14, 8-day forecast charts of 500 mb level were made daily (mean r = 0.82). Suggestions are made for further analysis. *Subject Headings:* **1. Long range forecasting 2. Symmetry points 3. Analogs.**—*C.E.P.B.*

3.10–82 551.509.33

Mironovitch, V., **Principes essentiels de la méthode Moultanovski de prévision à longue échéance.** [Essential principles of the Multanovskiĭ method of long range forecasting.] *La Météorologie*, 4th Ser., No. 23:197–220, July–Sept., **1951.** 18 figs., 8 refs. French, English and Spanish summaries p. 197. **DWB**—A lengthy, critical review of the methods and results of the famous Multanovskiĭ school of long range forecasting. Many charts are reproduced to illustrate the concepts of polar (and ultrapolar) axes, composite charts, centers of action, secondary centers of action (similar to Weickmann's symmetry points) and natural synoptic periods, which were introduced by Multanovskiĭ and his collaborators. After describing these "tools," the author discusses the properties and behavior of these charts and, finally, their usefulness in seasonal and long range forecasting. Periodicity or rhythm, the philosophy that each daily synoptic chart has in it the seeds which produce the situation in ensuing days, and the applicability of these methods to western Europe are also discussed. Admitting that the methods cannot be subjected to statistical tests (they are purely descriptive), the author still recommends them for use in France. A brief résumé of the scientific career of Multanovskiĭ is included. It is stated that as early as 1910, with his concepts of normal and ultrapolar axes and their explanation, he anticipated the idea of high or low zonal index, or of zonal and meridional flow and of "blocking." He died at the age of 62 on March 4, 1938, shortly after his long range forecast unit was seriously divided over the question of the existence of rhythms (of 90 and 150 days) in the occurrence of ultrapolar axes. Asknaziĭ proved that there were no such rhythms even allowing the wide tolerance of ±2 days or of 500 km in latitude or longitude (<16% coincidence). *Subject Headings:* **1. Long range forecasting 2. Multanovskiĭ's method 3. U.S.S.R. I. Multanovskiĭ, V. P. II. Asknaziĭ, A. I.**—*M.R.*

3.10–83 551.509.33:551.543.5

Müller-Annen, Hans, **Andauerkarten der Luftdruckänderungen als Hilfsmittel bei der Mittelfristvorhersage.** [Duration charts of pressure changes as an aid in medium range forecasting.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:33–36, **1952.** 3 figs. **MH-BH**—Charts are constructed from 24-hour pressure changes, showing how long pressure tendencies maintained the same sign at fixed points. These help in extended forecasting. *Subject Headings:* **1. Extended forecasting 2. Pressure changes.**—*C.E.P.B.*

3.10–84 551.509.33

Müller-Annen, Hans, **Witterungsvorhersagen nach der Methode der "ähnlichen Rhythmen." (Untersuchungen, Gedanken und Methoden zur Langfristvorhersage. 6 Beitrag.** [Weather forecasts by the method of "similar rhythms." (Investigations, ideas and methods of long-range forecasts. 6.)] *Annalen der Meteorologie*, 4(10–12):428–438, **1951.** 5 figs.

9 refs. German and English summaries p. 428. **DWB**—Owing to presence of rhythms, similarity in sequence of, e.g., rainfall in the same period (10 days) in several years is likely to persist and give a forecast for next 10 days. Author takes account also of rainfall singularities and other elements such as monthly mean temperature. Method is then developed to include a network of stations. Synoptic similarity is not necessary but helps. Tests with 10-day and monthly forecasts of rainfall and temperature gave 65–62% success. Forecasting by wave analysis and symmetry points is briefly considered. *Subject Heading:* **1. Extended forecasting.** —*C.E.P.B.*

3.10–85 551.509.33:551.513.2

Namias, Jerome and Leight, Walter G., **The current long-range forecasting program of the U. S. Weather Bureau.** *Scientific Monthly*, 74(1):21–28, Jan. **1952.** 6 figs. **DWB**—The authors give a brief account of the development of long range forecasting, the assumptions underlying the procedure and a non technical description of the method of preparing long range forecasts involving the construction of pressure charts showing flow aloft, the prognostications of upper air and sea level patterns and of temperature departures from normal and the movement of air masses. Examples of pressure pattern charts, of surface temperature charts and of forecast charts are given. *Subject Headings:* **1. Long range forecasting 2. Forecasting techniques 3. U. S. Weather Bureau.**—*I.L.D.*

CLOUD SEEDING AND ARTIFICIAL PRECIPITATION

3.10–86 551.509.67

Bowen, E. G., **Australian experiments on artificial stimulation of rainfall.** *Weather*, 7(7):204–209, July **1952.** 2 figs., 2 photos, 6 refs. **DWB**—About 100 experiments led to conclusion that "given suitable cloud conditions, it is tolerably certain that seeding with dry ice produces rain which could not otherwise have fallen." These conditions are defined by cloud top temperature and cloud thickness. AgI requires lower temperature and is less effective. Water drop spraying is also promising. Limit of possible increase of rain in S.E. Australia 5–10%, but may be economically profitable in marginal wheat area. *Subject Headings:* **1. Artificial precipitation 2. Cloud seeding 3. Dry ice 4. Australia.**—*C.E.P.B.*

3.10–87 551.509.67

Davies, D. A., **Artificial stimulation of rain at Kongwa.** *Nature*, London, 169(4311):1001–1002, June 14, **1952.** 2 refs. **DWB**—Account of proposed experiments in which a mixture of particles of sea salt and calcium chloride is carried by balloon into nonfreezing clouds and scattered by explosion. *Subject Headings:* **1. Artificial precipitation 2. Cloud seeding 3. Kongwa, Tanganyika.**—*C.E.P.B.*

3.10–88 551.509.67:551.577.11

Langmuir, Irving, **Cloud seeding by means of dry ice, silver iodide, and sodium chloride.** *New York Academy of Science, Transactions, Ser. II*, 14(1):40–44, Nov. **1951.** 4 tables. **DWB**—The theory of precipitation formation and cloud seeding developed during recent years is summarized by the leading research scientist in this field. Effects of various cloud seeding experiments are discussed with special emphasis on the controversial experiments with silver iodide on October 14, 1948 and July 21, 1949 in New Mexico, and on regular weekly silver iodide seedings in New Mexico started in December 1949 and carried on for several months. The results of these periodic experiments are analyzed in terms of comparative precipitation and upper air temperature data which are found to show a definite periodicity following the rhythm of the experiments. *Subject Headings:* **1. Cloud seeding results 2. Artificial precipitation 3. Precipitation formation 4. Upper air temperatures 5. Silver iodide 6. New Mexico.** —*G.T.*

3.10–89 551.509.67:551.577.3(71)

§Wallace E. Howell Associates, Inc., **Evaluation report of the cloud seeding project in the Province of Quebec, October–December, 1951.** Cambridge, Mass. [1952]. 15 p. 2 tables,

charts. **MH-BH**—A large and impressive presentation of the seeding activities, the meteorological conditions and the probable results of the seeding which was carried on in central Quebec by the Aluminum Co. of Canada and the Shawinigan Water Power Co. from Oct. 8 to Dec. 10, 1951. Seeding was conducted on 53 days and resulted in "1¼ inches of precipitable water over 30,000 square miles, and about an inch for the 16,000 sq. miles of the Shawinigan watershed." Daily amounts ranged from 0 to .14 inch for 30,000 sq. mi. Daily weather charts, fronts, soundings, isohyets and relation to seeding points and a full page of discussion on each situation are presented. October and November 1941 (a year with heavy precipitation) is compared with October and November 1951 for evaluation. *Subject Headings:* **1. Cloud seeding 2. Quebec Province, Canada.**—*M.R.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

STRUCTURE OF THE ATMOSPHERE—IONOSPHERE

(*See also items:* 3.10–70, 3.10–139, 3.10–155, 3.10–180, 3.10–200)

3.10–90 551.510.41 546.214

Bowen, Gerald I. and Regener, Victor H., **On the automatic chemical determination of atmospheric ozone.** *Journal of Geophysical Research*, 56(3):307–324, Sept. 1951. 7 figs., 17 refs. **MH-BH**—Based on the reaction $O_3+2KI+H_2O \rightarrow 2KOH+O_2+I_2$, an automatic, quantitative recording device has been constructed for use at the surface and in airplanes; it has been tested on South Capillo Peak (9200 ft), N. M., and at Acomita C. A. A. Airport (6500 ft) near Albuquerque. Continual recordings made during Dec. 1950 are reproduced showing relative variations in O_3 concentration, temperature, humidity, dew point, wind direction and speed for a 30-day period. It has been established that O_3 forms in the stratosphere and is brought downward behind polar fronts and by subsidence in anticyclones, and that it is destroyed by certain radiations from the sun and by vegetation. A network of surface ozone stations and one airplane observation station is being established in New Mexico. Construction and calibration of equipment is described and illustrated in detail by schematic and wiring diagrams. *Subject Headings:* **1. Ozone concentration 2. Chemical ozone determination 3. Ozone measurement networks 4. New Mexico.**—*M.R.*

3.10–91 551.510.41:546.264

†Effenberger, Ernst, **Messmethoden zur Bestimmung des CO_2-Gehaltes der Atmosphäre und die Bedeutung derartiger Messungen für die Biometeorologie und Meteorologie. (2. Teil: Ergebnisse der bisherigen CO_2-Messungen.)** [Methods of measurement of the CO_2 content of the atmosphere and the importance of such measurements for biometeorology and meteorology. (Pt. 2. Results of CO_2 measurements up-to-date.)] *Annalen der Meteorologie*, 4(10–12):417–427, 1951. 5 figs., 4 tables, 65 refs. German and English summaries p. 417. **DWB**—For Pt. 1 (Methods) *see MAB* 2.9–35, Sept. 1951. Results of 33 series of measurements 1816–1940 are tabulated and regional differences discussed. Diurnal variation shows a small doubtful excess at night; annual variation shows a slight excess in winter and deficit in early summer. Amount varies oppositely to intensity of radiation; other meteorological factors show little or no effect. Evidence for variation with height is conflicting. Further measurements on a uniform plan are required. *Subject Headings:* **1. Atmospheric composition measurement 2. Carbon dioxide variations.**—*C.E.P.B.*

3.10–92 551.510.41:546.214

Volz, F., **Über die Zerstörung des Ozons in der Troposphäre.** [On the destruction of ozone in the troposphere.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 35:257–261, 1952. 4 figs., 6 refs. German and English summaries p. 257. **MH-BH**—Measurements of effect of ozone on wood, stone, vegetation and water in Arosa show similarity and depend on turbulence. Clouds and combustion gases rapidly dissociate ozone, and in average cloudiness 1% of stratosphere ozone in mid-latitudes must be brought down daily to compensate loss. *Subject Heading:* **1. Ozone.**—*C.E.P.B.*

3.10–93 551.510.42 551.577.1(02)

†Buddhue, John Davis, **Meteoritic dust.** *New Mexico. University, Publications in Meteoritics*, No. 2, **1950.** 102 p. photos, tables, graphs, 108 refs., equations. Price: $1.50. **DLC**—A text dealing with methods of collecting dust from the atmosphere. Types of particles, physical and chemical tests, total annual dustfall, dust in hail and snow, annual variation and rate of fall of meteoric dust are presented. A brief history of studies on meteoric dust since 1819 and a 6-page bibliography add to the value of the book. The author has collected meteoric dust from rainwater with magnets, on slides from dry air, and from hail or snow. Microscopic analysis as well as chemical analysis is made and the results given in tables and illustrated by photographs. Some dust comes from interstellar space. Rate of fall is also calculated. *Subject Headings:* **1. Meteoric dust 2. Rainfall analysis 3. Text books.**—*M.R.*

3.10–94 551.510.42:58

Fletcher, Alfred H. and Velz, C. J. **Pollens: sampling and control.** (In: Michigan. University. School of Public Health, **Lectures presented at the Inservice Training Course in Air Pollution, February 6–8, 1950.** Ann Arbor, Mich., **1950.** p. 39–50. 10 figs., 21 refs. Discussion p. 51–52). **DWB**—Methods of pollen measurement are described. Detailed suggestions for control—covering survey, material, organization, legal and technical problems—are given. Emphasis is put on the use of 2-,4-dichlorophenoxyacetic acid. Distribution of pollen is represented on charts; pollen collectors and various types of pollen are illustrated. *Subject Headings:* **1. Pollen analysis 2. Aerobiology 3. Pollen control. I. Michigan. University. School of Public Health.**—*G.T.*

3.10–95 551.510.5:551.511:551.524.7:532.596

Pekeris, C. L. (*Inst. for Adv. Study, Princeton, N. J.*), **Free oscillations of an atmosphere in which temperature increases linearly with height.** *U. S. NACA, Technical Note* 2209, Oct. **1950.** 26 p. 3 diagrs., 10 refs., equations. Mimeographed. **DWB**—In an atmosphere where the temperature increases linearly with height at a constant rate, the acoustic propagation properties are radically different from those hitherto encountered in the theory of atmospheric tides. The phase velocity no longer approaches a limit with increasing period but increases linearly with the period. The region of maximum energy of the oscillation is shifted to increasingly higher elevations as the period is increased. The bearing of these results on the resonance theory of atmospheric tides is discussed. *Subject Headings:* **1. Atmospheric oscillations 2. Upper air temperatures 3. Acoustical propagation. I. U. S. NACA.**—*Author's abstract.*

3.10–96 551.510.534

Paetzold, Hans-Karl, **Weitere Bestimmungen der vertikalen Ozonverteilung bei Mondfinsternissen.** [Further determinations of the vertical distribution of ozone during lunar eclipses.] *Zeitschrift für Naturforschung*, 7a(5):325–328, May **1952.** 3 figs., 3 tables. **DLC**—Author gives 4 further examples of determination of amount of ozone (0.20–0.36 cm) and ratio ozone/air for heights up to 40 km in 1932 (60°S and 0°) and 1943 (50°N, 20°S). Results show decrease from high to low latitudes in spring. Heights of maximum (20–25 km) agree with balloon results. *Subject Headings:* **1. Ozone distribution 2. Lunar eclipses.**—*C.E.P.B.*

3.10–97 551.510.535

Appleton, Sir Edward Victor and Piggott, W. R., **The morphology of storms in the F2 layer of the ionosphere. 1. Some statistical relationships.** *Journal of Atmospheric and Terrestrial Physics*, London, 2(4):236–252, **1952.** 10 figs., 10 tables, 5 refs. **MH-BH, DWB**—Variations of F2 critical frequency during ionospheric storms show a strong negative departure in middle latitudes (Slough, Washington) usually coinciding with well marked increases at magnetic equatorial stations (Huancayo, Johannesburg), both at sunspot maximum and minimum. Stations widely separated in longitude show little correlation but for the largest deviations there is a positive relation. In temperate latitudes maximum deviation is a little before local noon, recovering slowly. In local winter, disturbances are relatively rare in middle latitudes; there is no relation between N. and S. Hemispheres. Near magnetic

pole distribution of + and − deviations is symmetrical. *Subject Headings:* **1. Ionospheric storms 2. F2 layer.**—*C.E.P.B.*

3.10–98 551.510.535

Bailey, V. A., Smith, R. A., Landecker, K., Higgs, A. J. and Hibbard, F. H., **Resonance in gyro-interaction of radio waves.** *Nature*, London, 169(4309):911–913, May 31, **1952.** 3 figs., 13 refs. **DWB**—Describes experiments in Australia in which a gyrowave was radiated vertically as square pulses of frequencies 1255 to 1880 kc/s, the local gyro-frequency being estimated from magnetic data as 1530 kc/s. Theory predicted that if another wave (the "wanted wave") is absorbed in the E layer, resonance will occur. Two-humped resonance was observed on either side of 1530 kc/s. It is considered that this method will lead to fuller knowledge of the E layer, especially its magnetic field. *Subject Heading:* **1. Ionospheric research.**—*C.E.P.B.*

3.10–99 551.510.535:621.396

Banerjee, S. S. and Mehrotra, R. R., **Intensity variation of short wave signals and their bearing on the ionosphere.** *Journal of Scientific and Industrial Research*, Delhi, 11(1):11–13, Jan. **1952.** 4 figs., 15 refs. **DWB**—Theory of fading and history of work along that line is briefly reviewed. Fading patterns are classified under periodic and random types, with many subdivisions of these. This classification system has proven useful in predicting nature of fading patterns. Special interest attends periodic fading patterns. It is possible to calculate from records obtained during this type (such as illustrated) the rates of change of electron density and the semithickness of change of electron density and the semithickness of the ionized layer. Also, undulations in ionosphere affect short wave radio fading patterns, such as illustrated. *Subject Headings:* **1. Radio fading patterns 2. Ionospheric variations 3. Short wave radio transmission.**—*M.R.*

3.10–100 551.510.535:621.396

Banerjee, S. S., Mehrotra, R. R. and Rajan, V. D., **Scattering of radiowaves and undulations in the ionosphere.** *Science and Culture*, Calcutta, 17(4):45–46, July **1951.** refs. **DWB**—The authors discuss a type of ionospheric scattering which is observed before the frequency of transmission reaches the critical frequency, and the centers of which appear to be in the F2 region of the ionosphere and which may be observed with low power transmitters. A description is given of this ionospheric scattering as observed by radiation of pulses at vertical incidence during evening and night, and photographs are included. *Subject Headings:* **1. Ionospheric scattering 2. F2 layer 3. Radio wave propagation 4. India.**—*I.L.D.*

3.10–101 551.510.535

Bibl, K. and Rawer, K., **Les contributions des régions D et E dans les mesures de l'absorption ionosphérique.** [The contributions of regions D and E in the measurements of ionospheric absorption.] *Journal of Atmospheric and Terrestrial Physics*, London, 2(1):51–65, **1951.** 8 figs., 6 tables, 8 refs., 9 equations. English summary p. 51. **MH-BH**—Selective absorptions on frequencies 2 to 5.6 MHz at Slough and Freiburg are used to calculate contributions of D and E layers 1949–1950 by a method which is set out in detail. Values usually attributed to D are found to be due partly to a fairly constant contribution by E. This constant gives a number of collisions in center of E layer in good accord with temperature and pressure at 125 km. *Subject Headings:* **1. Ionospheric structure 2. D layer 3. E layer.**—*C.E.P.B.*

3.10–102 551.510.535:523.77

Bracewell, R. N., **Theory of formation of an ionospheric layer below E layer based on eclipse and solar flare effects at 16 kc/sec.** *Journal of Atmospheric and Terrestrial Physics*, London, 2(4):226–235, **1952.** 4 figs., 13 refs., equations. **MH-BH, DWB**—The CHAPMAN theory of the ionosphere indicates that a decrease in the incident radiation should have little effect on height of reflection. This was tested during partial solar eclipse of April 28, 1949, at Cambridge, England, on 16 kc/sec transmission from Rugby, and a symmetrical anomaly of about 1 km was found. A new theory is presented in which the condition, that electron

density is negligible compared with ionizable particles, is removed. This agrees with the eclipse observations; the ionizing radiation originates regularly over the sun's disk and not specially in active regions. *Subject Headings:* **1. Ionospheric research 2. Solar eclipses.**—*C.E.P.B.*

3.10–103 551.510.535

Heading, J. and Whipple, R. T. P., **The oblique reflection of long wireless waves from the ionosphere at places where the earth's magnetic field is regarded as vertical.** *Royal Society of London, Philosophical Transactions, Ser. A*, 244(887):469–503, April 3, **1952.** 24 figs., 2 tables, 15 refs., 92 equations. **DWB**—"Equations are developed for the electromagnetic field in a horizontally stratified medium of varying electron density, the presence of a vertical external magnetic field and the collision frequency of the electrons with neutral molecules being taken into account." In certain conditions the ionosphere splits into two, for each of which the equations can be solved exactly. The results are illustrated for a model atmosphere. *Subject Heading:* **1. Ionospheric reflection.**—*C.E.P.B.*

3.10–104 551.510.535:621.396

Kelso, John M., **Radio-wave propagation at oblique incidence including the Lorentz polarization term.** *Institute of Radio Engineers, New York, Proceedings*, 40(1):87–97, Jan. **1952.** 17 figs., 11 refs., 35 equations. **DLC**—An extension of author's previous work on the vertical incidence absorption of a radio wave in a deviating layer. As in the first paper, the present paper is also based on approximations given by HACKE. Following quantities are studied: the true height of reflection, ray path, reflection coefficient, range in the ionosphere and the group path without introducing earth's effect. Assuming the earth to be first plane and then curved, the author considers analytically: the ground range, the reflection coefficient as a function of ground range and the group path. Some limitations and restrictions applied are given. *Subject Headings:* **1. Radio wave propagation 2. Microwave transmission 3. Ionosphere 4. Microwave research.**—*W. N.*

3.10–105 551.510.535:523.5:551.508.96

Watson, Fletcher G., **Meteors, the stony and metallic particles that enter the earth's atmosphere can now be perceived day or night and rain or shine by radio echo.** *Scientific American*, 184(6):23–28, June **1951.** photos, diagr. **DLC**—Two techniques of detecting meteors, one based on radar echoes and the other on radio whistles, are described and some of the results of their application mentioned. Attention is given to the possibility of a more detailed understanding of the composition and structure of the ionosphere, and particularly the E-layer, from evaluation of meteor ion trail measurements. Photos of radio echo recordings, meteor trails and a spectrum are presented. Analyzing large amount of available data is declared to be immediate major problem of research. *Subject Headings:* **1. Meteors 2. Radar echoes 3. Radio echoes 4. Ionospheric structure.**—*G.T.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

(*See also items:* 3.10–95, 3.10–115, 3.10–205)

3.10–106 551.511:551.542

Čadež, M., **Sur l'énergie potentielle du champ barique.** [On the potential energy of the baric field.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 5(1):5–16, **1952.** 13 refs., 17 equations. French, German and English summaries p. 5–6. **DWB**—There is a permanent flow of energy through every air particle to or from the surrounding air. This is defined by the gradient and pressure forces. It modifies the potential energy of the pressure field (defined by the enthalpy) and the internal energy of the particle. *Subject Heading:* **1. Energy exchange.**—*C.E.P.B.*

3.10–107 551.511:551.574.1

Dufour, L. (*Uccle, Belgium*), **Sur la thermodynamique de la condensation dans l'atmosphère.** [Thermodynamics of condensation in the atmosphere.] *Belgium. Institut Royal*

Météorologique, Mémoires, v. 42, 1951. 39 p. equations. **DWB**—In this purely theoretical monograph, the author attempts to develop in a systematic manner the thermodynamic equations used in studying condensation processes in the atmosphere, following the method developed by R. DEFAY in his work on thermodynamics of surface tension (1934). It is assumed (after GIBBS) that the properties of the gas or water are constant or homogeneous up to the point of contact of the two phases and that the surface of separation is geometric. After setting up the basic equations, the author treats of the Clausius, Kirchhoff and Kelvin-De-Donder relations, and the conditions of mechanical equilibrium, the superficial phase, the states of equilibrium, and makes some applications to the study of evaporation and cloud physics. *Subject Headings:* **1. Thermodynamics 2. Condensation 3. Cloud physics.**—*M.R.*

3.10–108 551.511:551.513.1

Estoque, Mariano A., **On the properties of two-dimensional wave motions in an atmosphere which is characterized by zonal winds.** *New York University. College of Engineering, Meteorological Papers*, 1(5), Oct. 1950. 30 p. 9 figs., 33 refs., 33 equations. **DWB**—Oscillations superimposed on a zonal motion are examined at constant absolute vorticity in two or more latitude belts. By combining the vorticity equation with a stream function, suggested by the equation of continuity, the author obtains a differential equation of the motion involving only a single variable which is the basis for subsequent developments of the theory. The disturbance is assumed to be a complex exponential form. The properties of waves are studied in a fluid system possessing discontinuities separating zones of different constant vorticity profiles. The calculated wind profile is most dependent on the selected latitude of the wind discontinuity. Expressions for wave velocities are derived. A quantitative test is made for an actual comparison between theory and observations. *Subject Headings:* **1. General circulation 2. Dynamics of the atmosphere 3. Vorticity 4. Atmospheric motion.**—*A.A.*

3.10–109 551.511 551.513.2:551.557

Flohn, Hermann, **Behrmanns "Prinzip der Selbstverstärkung" in der Meteorologie und die Mäanderbildung in Atmosphäre und Ozean.** [Berhmann's "Principle of self-generation" in meteorology and the development of meanders in the atmosphere and ocean.] *Erde*, Berlin, (3/4):211–219, 1951/1952. 23 refs. German and English summaries p. 211. **DLC**—Self-magnifying processes analogous to the dynamo-electric principle are frequent in meteorology, e.g., in relations between pressure and wind in frontal zones, leading to wave disturbances, etc. Other examples are chain reaction in supercooled clouds, moist-labile convection thunder rains, tropical cyclones, cold air bubbles and winter continental highs. Author then develops analogies between meandering of jet stream, ocean currents, rivers and streams, and suspects a relation between current velocity and displacement of sinuosities. *Subject Headings* **1. Dynamic instability 2. Jet stream.**—*C.E.P.B.*

3.10–110 551.51

Freeman, John C., **The equations for two internal layers in a rotating coordinate system** (In: Chicago. University. Dept. of Meteorology, Contract Cwb-8136, **Final Report on Cooperative Research Project on Severe Storms**, Sept. 1951. p. 20–23. 11 refs., equations. **DWB**—An unsuccessful attempt was made to develop equations for studying the motion of two layers with inclusion of the Coriolis force (which had previously been neglected). *Subject Headings:* **1. Internal waves 2. Coriolis parameter 3. Dynamics of the atmosphere. I. Contract Cwb-8136 II. Chicago. University. Dept. of Meteorology.**—*M.R.*

3.10–111 551.511:551.242:550.3

Haskell, Norman A., **The dispersion of surface waves on multi-layered media.** *U. S. Air Force, Cambridge Research Center. Geophysical Research Papers*, No. 9, Aug. 1951. 28 p. graphs, tables, refs., equations. **DWB**—A matrix formalism developed by W. T. THOMSON is used to obtain the phase velocity dispersion equations for elastic surface waves of Rayleigh and Love type on multi-layered solid media. The method is used to compute phase and group velocities of Rayleigh waves for two assumed three-layer and one two-layer model of the earth's crust in the continents. The computed group velocity curves are compared with published values of the group velocities at various frequencies of Rayleigh waves over con-

tinental paths. The scatter of the observed values is larger than the difference between the three computed curves. It is believed that not all of this scatter is due to observational errors but probably represents a real horizontal heterogeneity of the continental crusts. *Subject Headings:* **1. Rayleigh waves 2. Love waves 3. Seismic waves.**—*Author's abstract.*

3.10–112 551.511:551.547:551.557

James, R. W., **On the vertical structure of pressure and wind-fields.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 5(1):17–35, **1952.** 8 figs., 2 tables, 6 refs., equations. English, German and French summaries p. 17–18. **DWB**—Decrease of pressure gradient and geostrophic wind with height is exponential in diverse systems such as hurricanes, heat lows, occluded cyclones and warm anticyclones. GOLDIE's studies of variation of momentum with height, and analysis of wind variance with height, gave similar results. The strength of the mean westerly flow over N. America varies with season and latitude but the shape of the vertical profile (fig. 7, 8) does not vary significantly up to great heights. *Subject Heading:* **1. Geostrophic winds.**—*C.E.P.B.*

GENERAL CIRCULATION

(*See also items:* 3.10–7, 3.10–12, 3.10–78, 3.10–85, 3.10–108, 3.10–109, 3.10–156, 3.10–196 to 3.10–198, 3.10–231)

3.10–113 551.513

Rodewald, Martin, **Wetterskizze Nr. 10. Eine zeitweilige Asymmetrie der Zirkulation im Nordatlantik und Nordpazifik.** [Weather sketch No. 10. A temporary asymmetry of the circulation in the North Atlantic and North Pacific.] *Annalen der Meteorologie*, 4(79):406–408, **1951.** fig., 3 refs. **DWB**—In winter 1949–1950 pressure was very low over N. Atlantic and high over Aleutians, especially Feb. 1–5 (chart) with centers below 955 mb WSW of Iceland and 1040 mb over Aleutians. A cold N.W. current from Aleutian High across Canada intensified cyclonic activity over Atlantic. *Subject Headings:* **1. Atmospheric disturbances 2. North Atlantic 3. North Pacific.**—*C.E.P.B.*

3.10–114 551.513:551.524.37

Scherhag, Richard, **Die grosse Zirkulationsstörung im Jahre 1940.** [The great disturbance of the circulation in 1940.] *Annalen der Meteorologie*, 4(79):321–329, **1951.** 7 figs., table, 3 refs. German and English summaries p. 321. **Ergänzung** [Completion] by M. RODEWALD, p. 329, fig., table. **DWB**—Charts based on World Weather Records show that in Dec. 1939 and Jan. 1940 areas of excess pressure covered the Arctic and tropics with a deficit in middle latitudes. In the cold Feb. 1929 by contrast there was only a local excess over Scandinavia. In winter 1939/40 the atmospheric circulation was weakened over the whole world, in contrast with mild Dec. 1924. In Jan. 1940 temperature showed a negative anomaly over U. S. A., all Europe and W. Asia, exceeding 10°C in Europe and Asia, but an excess over Canada and E. Siberia. The addendum gives zonal pressure departures in Nov. 1939. *Subject Headings:* **1. Anomalies 2. Atmospheric circulation 3. Severe winters. I. Rodewald, Martin.**—*C.E.P.B.*

3.10–115 551.513.1:551.511

Möller, Fritz, **Die Aufrechterhaltung der Westdrift durch Grossaustausch.** [Maintenance of the westerly drift by large scale exchange.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:135–138, **1952.** 3 figs., table, 9 refs., 3 equations. **MH-BH**—The mechanism of the maintenance of the westerlies is discussed and it is shown that the acceleration term can be applied to a limited region as well as a whole latitude circle. Acceleration due to large scale Austausch, and inertia, are calculated for N. W. Europe, summer 1949 and winter 1949/50. *Subject Headings:* **1. Atmospheric circulation 2. Momentum transfer 3. Northwest Europe.**—*C.E.P.B.*

3.10–116 551.513.1

Starr, V. P. and White, R. M., **Schemes for the study of hemispheric exchange processes.** *Royal Meteorological Society, Quarterly Journal*, 78(337):407–410, July **1952.** 3 tables, 3

equations, 4 refs. **DWB**—Schemes of measurement of momentum flux across constant latitude, due to PRIESTLEY and the authors, are compared, with an example from 31°N, Feb 1949–Jan. 1950. Correlation between eastward and northward components of vector wind exceeds +.7 in 30–40,000 ft (jet stream). *Subject Headings:* **1. Meridional exchange 2. Momentum transfer.**—*C.E.P.B.*

3.10–117 551.513.2:551.524.34

Brezowsky, Helmuth, **Säkuläre Schwankungen der Zirkulation.** [Secular variations of the circulation.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:48–56 **1952.** 5 figs., 5 refs. **MH-BH**—The seasonal frequencies of general weather types in Europe are graphed as 10-year running means, 1881–1950. These confirm that the climatic discontinuity about 1900 was due to an increase in the zonal circulation. In spring and autumn this persisted but in winter it gave place to Nly and Ely types around 1930. The changes are discussed decade by decade, and the differences 1900–1910 and 1920–30 shown schematically. These illustrate the importance of the position of the N. Hemisphere cold pole (cold pole to E, zonal circulation, mild winters; cold pole to W, meridional circulation, cold winters). *Subject Headings:* **1. Meridional circulation 2. Temperature trends.**—*C.E.P.B.*

3.10–118 551.513.7:551.543(213)

Frolow, S., **Régimes bariques dans deux réseaux intertropicaux éloignés.** [Pressure regimes in two distant intertropical areas.] *La Météorologie*, 4th Ser., No. 23:153–174, July /Sept. **1951.** 12 figs., 34 refs. French, English and Spanish summaries p. 153. **MH-BH**—Although certain marked differences exist between synoptic meteorological processes in temperate and in tropical regions, so that the "Norwegian" methods of analysis obviously do not apply, the earlier attempts at tropical analysis over-simplify these processes. However much can be gained by comparing the individual processes in two such widely separated regions of the tropics as the Antilles and the western Indian Ocean. A study of pressure changes due to easterly waves shows that the latter do not exist in the Madagascar Region as in the Caribbean. Local or continental influences play an important role in many other respects. *Subject Headings:* **1. Synoptic analysis 2. Tropical meteorology 3. Pressure variations 4. Madagascar Region 5. Caribbean Region.**—*M.R.*

ATMOSPHERIC DISTURBANCES

(*See also items:* 3.10–7, 3.10–74, 3.10–188, 3.10–209, 3.10–235, 3.10–236, 3.10–246, 3.10–277)

3.10–119 551.515.1 551.577.57(794/7

Smith, Clarence D., Jr., **The intense Pacific coast storms of October 26–28, 1950.** *Monthly Weather Review*, 78(10):191–195, Oct. **1950.** 11 figs., table, 6 refs. **DWB**—Two depressions brought destructive winds (up to 75 mph) and record rains to Washington, Oregon and N. California. Pressures of 967 and 970 mb in centers compared with previous record of 980 mb. The synoptic analysis shows that the polar front was pushed south to 35°N by a cold air mass from Siberia overlain by warm air, and depressions approaching the coast deepened rapidly. They were followed by a series of small stable waves on the front. *Subject Headings:* **1. Barometric depressions 2. Excessive rainfall 3. Washington 4. Oregon 5. California.**—*C.E.P.B.*

3.10–120 551.515.11 551.515.7

Faust, Heinrich, **Zur Dynamik der Hoch- und Tiefdruckgebiete.** [On the dynamics of high and low pressure areas.] *Germany. Deutscher Wetterdienst in der US-Zone, Bericht* No. 35:92–99, **1952.** 4 figs., table, 18 refs. **MH-BH**—The mean interdiurnal temperature changes at pressure levels from the surface—100 mb are found from 120 quasi-stationary anticyclones and depressions. Advection and radiation effects nearly cancel out and the results show the general circulation in each case. They also lead to the different tropopause heights. *Subject Headings:* **1. Structure of depressions 2. Anticyclone structure.**—*C.E.P.B.*

3.10–121 551.515.13(261)

Rodewald, Martin, **Der "Adolf Leonhardt"-Orkan vom 26. Dezember 1951.** [The "Adolf Leonhardt" hurricane of Dec. 26, 1951.] *Wetterlotse*, Hamburg, No. 38:49 53, April 1952. fig. **DWB.** Wiese, Joachim, **Bericht über die Reise des MS "Adolf Leonhardt" von Norfolk, Va., nach Bremen in der Zeit vom 18.12.1951 bis 18.1.1952.** [Report on the voyage . . . from Norfolk, Va. to Bremen, 12/18/1951–1/18/1952.] *Ibid.*, 53–57. **DWB**—The depression travelled on a straight track from S. of Cape Breton Is. at 18h on Dec. 24 to Scotland at 18h Dec. 27, deepening rapidly to 945 mb on Dec. 26 in 46°N, 26°W. Behind the cold front the wind reached 100 knots in very cold air. Wind W–WNW force 11 for 6 hours. Capt. Wiese gives a general report on the weather of a very stormy voyage. *Subject Headings:* **1. Barometric depressions 2. North Atlantic. I. Wiese, Joachim.**—*C.E.P.B.*

3.10–122 551.515.2:551(96)

†Hobbs, William Herbert, **Fortress Islands of the Pacific.** Ann Arbor, Michigan, J. W. Edwards, **1945.** 186 p. 107 figs., bibl. p. 163–176. **DWB**—Brief popular description of hurricanes, especially as they affect Pacific islands and atolls (p. 155–158). The book itself provides a handy reference source for topographic, geological and historical information on each of the many islands and island groups of the Pacific. *Subject Headings:* **1. Typhoons 2. Pacific Islands.**—*M.R.*

3.10–123 551.515.21

Koschmieder, Harald. **Zur Theorie der Hurricanes.** [On the theory of hurricanes.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:79–85, **1952.** 12 figs. **MH-BH**—The dynamics of a hurricane are discussed on the basis of an upward current in the eye between ground and a blocking layer, above which is a down current. The resulting pressure profile agrees with that of a Florida hurricane. *Subject Heading:* **1. Hurricane dynamics.**—*C.E.P.B.*

3.10–124 551.515.21(265/6)

Watanabe, K., **Some studies on typhoons of 1949 and 1950. Part 1. Typhoon eye.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(9):314–319, Sept. **1951.** 6 figs., ref. In English, Japanese summary p. 318–319. **MH-BH**—Changes in the shape and diameter of the eye of 16 typhoons studied by aircraft in the Pacific 1949–1950 are tabulated for formative, immature, mature and decay stages and summarized. The boundary is a sort of frontal surface; along the I. T. C. the eye becomes elongated or tilted. When the cloud ring is broken the position of the opening affects the distribution of wind and weather and the deepening or filling of the typhoon. *Subject Headings:* **1. Typhoon structure 2. Pacific Ocean.**—*C.E.P.B.*

3.10–125 551.515.23(52)

Saito, N., **Two cyclones with abnormal path.** *Journal of Meteorological Research*, Tokyo, 3(2):63–69, Jan. **1951.** 5 figs., table, 3 refs., equations. In Japanese, English summary p. (2). **DWB**—These cyclones were of tropical origin and had moved northward with a high speed towards Japan. Both were characterized by a deep cold pool on the foreside of the cyclone with cyclogenesis on the opposite side of the cold pool. It is shown that warm air advection above the 500 mb level and the upper cold pool were important in cyclogenesis. *Subject Headings:* **1. Tropical cyclones 2. Cyclogenesis 3. Cyclone tracks 4. Japan.**—*From Author's abstract.*

3.10–126 551.515.3(42)

Barnes, F. A. and King, C. A. M., **A tornado at Tibshelf, Derbyshire.** *Weather*, 7(7):214–220, July **1952.** 2 figs., 2 photos, 8 refs. **DWB**—Eye-witness account of a small tornado which travelled 2 miles N–S in Derbyshire on May 19, 1952. Inner core 15–20 yards diameter, outer circle 80–100 yards. Occurred on a minor cold front where two unstable air masses converged, aligned along a ridge. *Subject Headings:* **1. Whirlwinds 2. Tibshelf, England.**—*C.E.P.B.*

3.10–127 551.515

Gordon, A. H., **Waterspouts.** *Weather*, 6(12):364–371, Dec. **1951.** fig., plates 47 a 48 facing p. 376–377, 4 refs. **MH-BH**—Condensed from articles in *Marine Observer*. (*S MAB* 2.7–90, July 1951 and 2.11–83, Nov. 1951.) Includes world chart of frequency p 10,000 observations. *Subject Headings:* **1. Waterspouts 2. Mediterranean Sea.**

3.10–128 551.515

Waterspouts. *Marine Observer*, 22(157):123, July **1952. DWB**—1. Aug. 31, 1951 34°53′N, 40°38′W, rotating anticlockwise in about 6 sec. 2. 37°27′N, 153°48′W apparent continually changing direction of rotation (probably an optical illusion). *Subject Headin* **Waterspouts.**—*C.E.P.B.*

3.10–129 551.515.3(4

Kohlbach, Walter, **Die Trombe von Hannover am 15.9.50.** [The Hanover whirlwi on Sept. 15, 1950.] *Annalen der Meteorologie*, 4(10–12):482–485, **1951.** 2 figs., 10 ref **DWB**—This whirlwind developed on a cold front and travelled NE for 17 km. A flying ro 6×8 m weighing 1200 kg indicates an up wind of at least 18 m/s. Radiosonde showed a d adiabatic gradient below an isothermal layer. *Subject Headings:* **1. Whirlwinds 2. Hanove Germany.**—*C.E.P.B.*

3.10–130 551.515

Phillips, P. E., **Triple-walled waterspout.** *Meteorological Magazine*, London, 81(957):88 89, Mar. **1952.** fig. **DWB**—Sketch and description of waterspout in 3½°N, 106°E, May 2 1951. A hollow cloud tube had another hollow tube inside it and was partly covered by a thic cloud "sleeve." *Subject Heading:* **1. Waterspouts.**—*C.E.P.B.*

3.10–131 551.515.3:6 551.5

Rossmann, Fritz, **Zur Frage der Wasserhosen. Richtlinien für das Beobachten u Photographieren.** [On waterspouts. Instructions for observation and photography *Wetterlotse*, Hamburg, 39:65–71, April **1952.** fig. **DWB**—The bridge of a ship is a good pla from which to observe waterspouts. Points to be noticed are: Shape and relation to gener wind field (sketches, photos if possible), times of changes of shape, bearing and speed, curvatur cloud, weather, precipitation, thunder, spray, etc. *Subject Heading:* **1. Waterspout observa tion.**—*C.E.P.B.*

3.10–132 551.515.3(4

Szczyrbak, S., **Funnel cloud over the Wash.** *Meteorological Magazine*, London, 81(955 25–26, Jan. **1952.** fig., 2 photos. **DWB**—Sept. 16, 1951, travelling from WNW, length abo 300 ft. Broke up quickly over land. *Subject Headings:* **1. Waterspouts 2. The Was England.**—*C.E.P.B.*

3.10–133 551.515.3(267,521.

Tucker, C. H. and Wood, H. S., **Waterspouts. Indian Ocean. China Sea.** *Mari Observer*, 22(156):63, April **1952. DWB**—Describes a waterspout in 7°28′N, 77°31′E, Ap 5, 1951, 3000 ft high, and 19°36′N, 116°18′E, May 13, 1951, up to ½ mi wide. Facing p. 1 are two photos of waterspouts in Tyrrhenian Sea, Oct. 3, 1943. *Subject Headings:* **1. Wate spouts 2. Indian Ocean 3. China Sea.**—*C.E.P.B.*

3.10–134 551.515.3(458.

Waterspouts at Malta, October 14, 1930. *Meteorological Magazine*, London, 81(957):9 March **1952.** 2 photos. **DWB**—Two photos of waterspouts in fresh polar air. Up to were seen at same time. *Subject Headings:* **1. Waterspouts 2. Malta.**—*C.E.P.B.*

3.10–135 551.515.3(26

Waterspout off Saurashtra coast. *Indian Journal of Meteorology and Geophysics*, 2(4):29 Oct. **1951.** 4 figs. **MH-BH**—Description of a waterspout observed in the Arabian Se *Subject Headings:* **1. Waterspouts 2. Arabian Sea.**—*A.A.*

3.10–136 551.515.3(548.9)

Waterspout near Diamond Harbour (West Bengal) on 20 March 1951. *Indian Journal of Meteorology and Geophysics*, 2(3):221, July 1951. **MH-BH**—Description of a waterspout which descended from a cumulonimbus cloud and damage caused. *Subject Headings:* **1. Waterspouts 2. Diamond Harbour, Bay of Bengal, India.**

3.10–137 551.515.4:551.553.8(47)

Kolobkov, N. V., **Grozy i buri.** [Thunderstorms and other storms.] Moscow, Gosud. Izdat., 1951. 2nd ed. 72 p. 37 figs. **DLC**—A popular rendition of the author's "Grozy i shkvaly" which appeared in 1938. (*See MAB* D–14, April 1950.) Discusses thunderstorms (origin, development and behavior), protection against lightning, showers and protection against thunderstorm rainfall, hail, squalls, waterspouts, tornadoes, hurricanes, cyclones and many kinds of local wind storms. Many sketches are included to illustrate phenomena described. *Subject Headings:* **1. Thunderstorms 2. Wind storms 3. U.S.S.R.**—*M.R.*

RADIATION AND TEMPERATURE

RADIATION

(*See also items:* 3.10–184, 3.10–218)

3.10–138 551.521:523.32

Lettau, Heinz, **Was sagen die Temperaturen des Mondes über seine Oberfläche aus?** [What does the temperature of the moon tell us about its surface] *Umschau*, Frankfurt a.M., 52(14):417–419, July 15, 1952. 3 figs., refs. **DLC**—Temperature of moon's surface given by infrared radiation varies from +102°C at full moon to −148°C, in first quarter; that given by 1.25 cm radiation only between +27 and −73°C, with a phase lag. The heat constant of the moon's surface is very small and it is inferred that the surface consists of loose dust 40–50 cm thick, the top 0.2 cm being especially fine. *Subject Heading:* **1. Lunar temperatures.** —*C.E.P.B.*

3.10–139 551.521:551.510

Lossnitzer, H., **Die Bedeutung der Strahlungsmessmethoden für die Dynamik der Atmosphäre.** [The importance of methods of measuring radiation for the dynamics of the atmosphere.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 35:76–79, 1952. 6 figs. **MH-BH**—Sets out a list of atmospheric characteristics (turbulence, air mass, composition, temperature and moisture distribution, etc.) which can be estimated by measurements of radiation of different wave lengths. Examples are shown. *Subject Headings:* **1. Radiation 2. Atmospheric structure.**—*C.E.P.B.*

3.10–140 551.521.1:551.508.23(485)

*Aurén, T. E., **Studies of solar radiation.** *Arkiv för Geofysik*, Stockholm, 1(14):395–439, 1951. tables, graphs, diagrs., bibl. In English. **DWB**—Because the composition of the atmosphere varies from day to day and from place to place, the comparison of solar radiation records made even on clear days is extremely difficult. This work attempts to show the magnitude of these variations on clear days, based on records made in different spectral bands, at several places in the world (Mt. Whitney, Montezuma, Mount Wilson, Stocksund, Oregund and Abisko). Intensity of total radiation received at different times of day and solar angles on clear and partly cloudy days, the sky radiation near the sun on clear and hazy days, design of perisolarimeters, variations in spectral composition, constants of various instruments, the solar constant and factors affecting it are discussed and illustrated in tables and graphs. *Subject Headings:* **1. Solar radiation studies 2. Radiation measurements 3. Perisolarimeters 4. Stocksund, Sweden. I. Uppsala. Universitet. Meteorologiska Institutionen.**—*M.R.*

3.10–141 551.521.1:551.481(436)

Dirmhirn, Inge (*Vienna*), **Neuere Strahlungsmessungen in den Lunzer Seen.** [Recent radiation measurements in Lunz Lakes.] *Wetter und Leben*, Vienna, 3(11/12):358–360, Dec.

1951. fig., 2 tables, 5 refs. **MH-BH**—The transmission of the water of the Lunz Lakes various regions of the spectrum at depths of 1 to 7 m was investigated in 1950 and the measu ments were compared with observations made in previous years by Eckel and Sauberi The conservative property of the transmission values for a particular body of water is confirm and the seasonal variations are explained as result of changes in mineral and plankton conte Data are presented statistically and graphically. Also measurements of total radiation various depths were made and the significance of the observed values for transmitted to radiation for heat exchange is examined. *Subject Headings:* **1. Water transmission of radiati 2. Radiation measurements 3. Heat exchange 4. Lunz Lakes, Austria.**—*I.L.D.*

3.10–142 551.521.1 551.508.21(4

Kalitin, N. N., **Variations of the monthly total amounts of heat from solar radiatic** Translated by Elizabeth Heiden from original Russian article entitled: **Variatsii, mesiachny summ tepla solnechnoĭ radiatsii,** in *Meteorologiia i Gidrologiia*, No. 1:83–86, 1946. Edit by Malcolm Rigby. Washington, D. C., March **1947.** 7 p. 3 figs., 3 tables in photos appended, bibl. Typed. **DWB**—Data for Pavlovsk (near Leningrad (1912–1941) are ar lyzed and discussed. Instrumentation at Pavlovsk is described in detail. Variations monthly mean total solar radiation received on a horizontal and vertical surface are tabulat and plotted on graphs to show seasonal march and visibility and difference from year to ye for the same months (May and December). *Subject Headings:* **1. Solar radiation variatio 2. Radiation instruments 3. Translations 4. Pavlovsk, U.S.S.R. I. U. S. Weather Bure II. Heiden, Elizabeth (*trans.*) III. Rigby, Malcolm (*ed.*).**—*M.R.*

3.10–143 551.52

Schulze, Rudolf, **Einige vorläufige Ergebnisse von Messungen der Sonnen- und Himme strahlung auf geneigten Flächen.** [Preliminary results of measurements of sun and s radiation on inclined surfaces.] *Germany. Deutscher Wetterdienst in der US-Zone, Beric* No. 35:277–284, **1952.** 13 figs., table, 6 refs. **MH-BH**—Measurements of spectral distrib tion (violet, green and red) of sun and sky radiation on flat, inclined (45°) and vertical surfac at Wyk/Föhr were made with 9 Larché-Schulz radiation spheres. Results are shown in num ous figures. *Subject Heading:* **1. Global radiation.**—*C.E.P.B.*

3.10–144 551.521.11:551.524.

Grisollet, H., **Étude de la corrélation entre la dureé de l'insolation et l'amplitude de variation diurne de la température de l'air, à Paris.** [Study of the correlation between t duration of sunshine and the amplitude of the diurnal variation of air temperature at Paris *La Météorologie*, 4th Ser., No. 23:175–184, July/Sept., **1951.** 4 figs., 7 tables, equatio French, English and Spanish summaries. **MH-BH**—Graphs show the year to year variati in sunshine duration, total radiation and mean diurnal temperature variation from 1928–19 for Paris (Parc St. Maur). Data are presented in tables and analyzed statistically and corre tion coefficients are calculated for each month (and found to be highest in spring and autum A linear regression line was found valid for relation between sunshine duration and diurr temperature variation for any given month, using 68 years of record. The effect of radiati on temperature variation is 60% greater in March and Nov. than in Jan. and June. *Subj Headings:* **1. Solar influences 2. Sunshine duration 3. Diurnal temperature variatio 4. Correlations 5. Paris, France.**—*M.R.*

3.10–145 551.521.13:551.521

Georgi, Johannes, **Nachtrag zur Prüfung der Solarkonstanten.** [Supplement to checki the solar constant.] *Meteorologische Rundschau*, 5(3–4):65, March–April **1952.** table, 7 re **DWB**—Summarizes various determinations of solar constant and the part due to ultraviol and infrared. *Subject Headings:* **1. Solar constant 2. Ultraviolet radiation 3. Infrar radiation.**—*C.E.P.B.*

3.10–146 551.521

Anthony, Romuald (*U. S. Naval Ordnance Test Station, Inyokern, Calif.*), **Atmosphe absorption of solar infrared radiation.** *Physical Review*, New York, 85(4):674, Feb. 15, 195

2 figs., 6 refs. **DWB** Solar radiation transmitted by the atmosphere was measured at Table Mt. with KBr double monochromator, and absorption coefficients calculated in "continuous" infrared spectrum by FOWLE's method. From 8 to 12.8 microns and 17.6 to 19 microns absorption follows Lambert's law within experimental accuracy. Absorption coefficients obtained are about twice those obtained by ADEL and ELSASSER for the former region. Author attributes all absorption to water vapor. No attempt to account for pressure and temperature effect is reported. *Subject Headings:* **1. Absorption by water vapor 2. Solar radiation 3. Radiation balance.**—*L.Kaplan.*

3.10–147 551.521.3:551.521.61

Fischer, Heinz, **On the absorption of water vapor in the infrared as a function of water path.** *U. S. Air Force, Air Materiel Command, AF Technical Report* 5660, Jan. 21, **1948.** 33 p. graphs, 12 figs., tables, 15 refs. **DWB**—An attempt to determine whether water vapor absorption of infrared follows a square root or an exponential (Lambert's) law, and the ranges of water path in which these laws are valid. Experimental data by F. E. FOWLE (1912, 1915) were used in the analysis. Conclusion is that water vapor absorption follows the square root law at small ranges of water path (w) and Lambert's law at large values of w. The square root law is valid up to transmission $T>0.5$ and the exponential law when $T<0.35$ with wave lengths from 0.9 to 8.0μ and in the ranges of the rotational band $>13.5\mu$. From 8.5 to 12.5μ absorption is continuous. *Subject Headings:* **1. Infrared absorption 2. Absorption by water vapor 3. Lambert's law. I. Fowle, F. E.**—*M.R.*

3.10–148 551.521.3:551.521.61

Howard, John N. and Chapman, Robert M., **The pressure dependence of the absorption by entire bands of water vapor in the near infrared.** *Optical Society of America, Journal,* 42(6):423–426, June **1952.** 4 figs., 2 tables, 2 equations. **DWB**—A study was made of the total absorption of five water vapor bands between 1μ and 7μ using a multiple-reflection absorption cell in which optical path length, water vapor density and total pressure could be varied independently. Absorption was determined as a function of these parameters. For the range of concentrations studied it was found that the fractional absorption of an entire band can be represented by an error-function formula

$$A = erf(t) = 2\pi^{-\frac{1}{2}} \int_0^t e^{-x^2} dx,$$

where $t = \frac{1}{2}\beta(\pi w)^{\frac{1}{2}}(P_T + P_p/760)^{\frac{1}{2}}$. Here w is the water vapor concentration, P_T the total pressure, and P_p the partial pressure of the water vapor. The quantity t in this formula is very nearly proportional to the fourth root of the pressure. Values of the "generalized absorption coefficient" β are determined by the five bands. *Subject Headings:* **1. Infrared absorption spectrum 2. Water vapor absorption bands 3. Vapor pressure.**—*Authors' abstract.*

3.10–149 551.521.3:551.508.21

Nicolet, Marcel, **La mesure du rayonnement solaire.** [Measuring solar radiation.] *Belgium. Institut Royal Météorologique, Miscellanées,* No. 21, **1948.** 37 p. **DLC**—This monograph deals with: 1) solar emissions, 2) atmospheric absorption of radiation, 3) the action of the lower atmosphere, 4) the solar constant and the spectral distribution of solar energy, 5) the absolute pyrheliometer, 6) the basic geometric proportion of actinometers and 7) continuous actinometer records. Considerable theory is included, and the several pyrheliometer scales and pyrheliometers are compared quantitatively. *Subject Headings:* **1. Solar radiation measurement 2. Pyrheliometers.**—*M.R.*

3.10–150 551.521.3

Plass, Gilbert N. and Warner, Douglas (*Johns Hopkins Univ., Baltimore, Md.*), **Pressure broadening of absorption lines.** *Physical Review,* New York, 2nd Ser., 86(1):138–139, April **1952.** 2 figs., 6 refs. **DWB**—LINDHOLM's asymmetrical formulas for collision line shape, based on statistical theory of broadening, are used to calculate absorption by asymptotic expressions for a single line with opaque center and for an idealized periodic band. Results are compared with those obtained from the symmetrical Lorentz formula. Treatment is based on assumption of nondegeneracy of energy levels involved in the transition. Absorption

due to single asymmetrical line is greater than that due to single Lorentz line, except for ver small absorption. For the idealized band, the asymmetrical line shape gives stronger absorp tion when the interval of validity of the Lorentz expression is smaller than the line spacin and weaker absorption when greater than the line spacing. [Abstractor notes that th assumptions made for single line absorption give upper limit of discrepancy since the win effect is exaggerated.] *Subject Headings:* **1. Atmospheric absorption bands 2. Pressur broadening 3. Radiation balance.**—*L.Kaplan.*

3.10–151 551.521.3:551.57

Werner, J., **Über die Bestimmung des Wassergehalts der Atmosphäre aus den Wasse dampfbänden des Sonnenspektrums mittels jenaer Interferenzfilter.** [On the determinatio of the water content of the atmosphere from the water vapor bands of the solar spectrum b the Jena interference filter.] *Germany. Deutscher Wetterdienst in der US-Zone, Berich* No. 35:302–303, **1952. MH-BH**—A modified technique gives water content of the atmospher with an accuracy of about ±3%. *Subject Headings:* **1. Absorption by water vapor 2. Wate vapor content of atmosphere 3. Jena interference filter.** —*C.E.P.B.*

3.10–152 551.521.3:551.521.6

Yamamoto, Gi-ichi (*Tôhoku Univ.*), **On the relation between transmission function c column and that of slab for infra-red absorption band.** *Tôhoku University. Science Report 5th Ser., Geophysics*, 3(3):130–132, Dec. **1951.** fig., 4 refs., 14 equations. **MH-BH**—Th mean value of the factor by which path-lengths must be multipled to convert column trans mission functions for slab transmission is found to be 1.5 (i.e., the same as for grey transmissio for an Elsasser type idealized band using as a "reasonable" definition the constant by whic column transmission must be so corrected in order to have the same average with respect t the reduced path-length as slab transmission, over a path-length range from zero to infinity The actual value of the factor ranges from 1 to 2, as for the grey case, but is smaller for sma absorption and larger for large absorption. The author calculates the factor for a 1:30 rati between half-width and line spacing and graphs it as a function of one-half the product of th Elsasser generalized absorption coefficient and the reduced path-length. This is compare with the corresponding factor for grey transmission plotted vs. optical path. [Abstracto notes that the abscissae are not comparable and the point of intersection has no significance and finds that curves of the factor vs. the logarithm of the reciprocal of the transmissio (optical path for grey case) intersect at a point for which the absorption is 3%, indicating larger mean factor should be used for line transmission than for grey transmission.] *Subje Headings:* **1. Atmospheric absorption bands 2. Infrared radiation 3. Radiation balance.**— *L.Kaplan.*

3.10–153 551.521.4(54

Chacko, Oommen, **Further studies on the heat radiation from the night sky at Poona** *Indian Journal of Meteorology and Geophysics*, 2(3):190–196, July **1951.** 7 figs., 6 tables, 6 ref **MH-BH**—Observations were made with Ångström's pyrgeometer for three years. Monthl variation of night sky radiation for all nights and for clear nights given. Maximum sk radiation was registered during monsoon months. Hourly observations of heat radiation fro night sky, made on only a few nights. Most nocturnal variation of sky radiation is due t variation in radiation from air layers nearest the ground which are affected by nocturnal coolin Values of net radiation are compared with differences between screen minimum and gra minimum. *Subject Headings:* **1. Nocturnal radiation 2. Minimum temperatures 3. Poon India.**—*A.A.*

3.10–154 551.521.61:551.594.51:535.3

Bagraiatskiĭ, B. A., Krasovskiĭ, V. E. and Mordukhovich, M. I., **K voprosu ob infra krasnom izluchenii nochnogo neba i poliarnykh siianiĭ.** [On the problem of infrared radiatio of the night sky and aurora.] *Akademiia Nauk, SSSR, Doklady, Novaia Seriia*, L32(4):57 580, 1952. table, 2 refs. **DLC**—During March, 1951, 4 spectra were obtained of the auro in the 8000–11,000 Å (near infrared bands) and one of the night sky light in the absence an aurora. Results of line intensity measurements of the spectrophotographs are tabulate

(for 7800, 8400, 8700, 9200 and 10,100 Å). It was noted that, although little regional or time variation was found, there was a marked diminution of intensity in the infrared of the night sky during auroral displays. Later (mid-August, 1950) it was found there was an almost total absence of night sky radiation (.8–1.1μ) at Simeiz (Crimea) during a period of extreme auroral activity (Aug. 18–20, 195 auroras observed all over the Northern Hemisphere). *Subject Headings:* **1. Infrared radiation 2. Light of the night sky 3. Auroral spectra 4. Infrared spectrum of aurora.**—*M.R.*

3.10–155 551.521.63:551.524.7:551.510.4

Gauzit, Junior, **L'absorption du rayonnement solaire ultraviolet et la température de la haute atmosphère vers 100 km. d'altitude.** [Absorption of ultraviolet solar radiation and the temperature of the upper atmosphere at 100 km height.] *Académie des Sciences, Paris, Comptes Rendus*, 233(18):1048–1049, Oct. 29, **1951. DWB**—An investigation by R. PENNDORF of the formation of atoms of oxygen with high kinetic energy through photochemical dissociation of molecules serves as a basis for calculations undertaken by the author in order to determine the amount of average kinetic energy absorbed, at various levels of altitude, by oxygen atoms at the moment of their formation. As a result of these calculations, the author concludes that a temperature of 800°K between 90 and 95 km and 3,800°K at about 130 km should develop unless it were for a considerable loss in heat through radiation, conductivity or convection. *Subject Headings:* **1. Ultraviolet radiation 2. Atmospheric absorption 3. Upper air temperatures.**—*G.T.*

3.10–156 551.521.63:551.513:551.509.33

Prudhomme, André, **Sur la nature des phénomènes solaires susceptibles de modifier la circulation atmosphérique.** [On the nature of solar phenomena capable of modifying atmospheric circulation.] *La Météorologie*, 4th Ser., No. 23:185–196, July/Sept., **1951.** 14 refs. French, English and Spanish summaries p. 185. Introduction by J. DUFAY. **MH-BH**—Various hypotheses regarding the mechanism by which solar activity affects the weather are discussed. Special attention is given to the theory of HAURWITZ and the results of measurements made by A. and E. VASSY. The relation between Wolf numbers, chromospheric eruptions, anticyclonic or cyclonic development, ionospheric storms, magnetic storms and characteristic magnetic numbers are shown for the month of Sept. The best correlations are found between variations in UV radiation accompanying chromospheric eruptions, and magnetic disturbances. It was found by a statistical study that an increase in meridional circulation either from polar or subtropical anticyclones usually follows soon after solar disturbances which affect UV radiation. Blocking action also is noted at such times. This confirms HAURWITZ's theory and should, if further evidence is favorable, prove a useful tool for forecasting several days in advance. *Subject Headings:* **1. Solar influences 2. Ozone layer 3. Extended forecasting 4. Magnetic disturbances. I. Dufay, J. II. Haurwitz, B.**—*M.R.*

3.10–157 551.521.64:537.56/8

Chatterjee, S. D., **Ionizing power of cosmic ray particles at sea level.** *Canadian Journal of Physics*, Ottawa, 29(6):495–504, Nov. **1951.** 4 figs., 12 refs., equation. **DWB**—Using a proportional counter telescope in his experimental exploration of the nature and ionizing power of cosmic ray particles, author has found: 1) that soft component of cosmic radiation at sea level consists mostly of relativistic electrons, 2) an appreciable number of showers are found to be present under a 1.8 cm thick lead plate and 3) even under a 20 cm thick lead plate, there are still appreciable numbers of electrons. *Subject Headings:* **1. Cosmic radiation 2. Ionization spectra 3. Cosmic ray observation.**—*W.N.*

3.10–158 551.521.64

†Daudin, J., **Le soleil et les rayons cosmiques.** [The sun and cosmic rays.] *Commission pour l'Étude des Relations entre les Phénomènes Solaires et Terrestres, Rapport* No. 7, **1951.** p. 135–164. 4 figs., 3 tables, 119 refs. **DWB**—Describes nature of cosmic radiation and heavy nuclei, relations to geomagnetic latitude, spectral energy. Observed variations with magnetic storms, sunspots and chromospheric eruptions, and variations in periods of 27 days, 24 and 12

hours, are summarized. Theories of origin are discussed on basis of solar magnetic field and solar cosmic eruptions. Various views of energy of cosmic rays are considered. On the question of solar or galactic origin no definite conclusion is reached. *Subject Heading:* **1. Cosmic radiation.**—*C.E.P.B.*

3.10–159 551.521.64

Elliott, H. and Dolbear, D. W. N., **Directional measurements of the diurnal variation of cosmic ray intensity.** *Journal of Atmospheric and Terrestrial Physics*, London, 1(4):205–211, **1951.** 12 figs., 16 refs., equations. **DWB**—The results of former measurements of the solar daily variation in cosmic ray intensity in the north and south directions have been confirmed by new data from shielded and unshielded recorders. The interpretation that the difference between the variations for the two directions is due to a non-isotropic distribution of the primary cosmic rays is strongly supported by measurements in the east and west directions. This lack of complete isotropy is discussed in relation to the solar streams which cause geomagnetic disturbances and which are here assumed to be polarized in a solar magnetic field. Good agreement is obtained between the observed effect and that calculated on this basis assuming a solar equatorial field strength of 8 gauss. It is shown that geomagnetic disturbances have a pronounced effect on the solar daily variation and on the south minus north difference. A small variation with sidereal time is shown to exist in the Manchester data and this is confirmed by an analysis of ionization chamber data from Huancayo, Christchurch and Cheltenham. The sidereal daily variation thus found has an amplitude of about .002% with a time of maximum at about 0500 h. This is opposite in phase to the variation expected on the basis of the COMPTON-GETTING effect and therefore a galactic origin for the primary cosmic rays is indicated. *Subject Headings:* **1. Cosmic ray directional measurement 2. Cosmic ray variations 3. Cosmic ray intensity 4. Geomagnetic disturbances.**—*Authors' abstract.*

3.10–160 551.521.64:550.385

Ferraro, V. C. A., **Theoretical studies relating to solar corpuscular streams and geomagnetic storms.** *Commission pour l'Étude des Relations entre les Phénomènes Solaires et Terrestres, Rapport* No. 7, **1951.** p. 131–134. 9 refs. **DWB**—Summarizes recent theories of the origin of solar corpuscular streams and their effects in causing magnetic and ionopsheric storms. *Subject Headings:* **1. Corpuscular radiation 2. Ionospheric storms 3. Magnetic storms.**—*C.E.P.B.*

3.10–161 551.521.64:551.524.7

Hazen, W. E. and Sherman, Noah, **Measurement of penetrating cosmic ray particles.** Michigan. University. Engineering Research Institute, Contract AF 19(122)-465, Report No. 2, Sept. 30, **1951.** 3 p. **DWB** Correlation between cosmic ray intensity measured underground and temperatures at 100, 150, 200 and 300 mb levels are given as evidence of a temperature coefficient for theoretical work on meson production in the stratosphere. Significance tests are applied and the results tabulated alongside of the coefficients. Results of winter measurements are expected to be more revealing. *Subject Headings:* **1. Upper air temperatures 2. Meson production 3. Cosmic rays. I. Michigan. University. Engineering Research Institute II. Contract AF 19(122)-465.**—*M.R.*

3.10–162 551.521.64:551.524.7

Iona, Mario, Jr., **Correlation of meteorological parameters with cosmic ray data.** Denver. University. Contract AF 19(122)-54, Report No. 1–8, July 15, 1949–March 31, **1951.** approx. 25 p. each report. plates. **DWB**—Work consists of a review of literature on the subject; theoretical treatment of magnitude of meteorological changes such as temperature and humidity in the free atmosphere; design of equipment for measuring and recording meson intensities at the surface and by balloon; installation and operation of equipment at Echo Lake (10,700 ft) and Mt. Evans, Colorado (14,150 ft) for 3 months; and analysis of data. *Subject Headings:* **1. Cosmic ray research 2. Cosmic ray instruments 3. Upper air computation 4. Correlations 5. Meson intensity. I. Denver. University II. Contract AF 19(122)-54.**—*M.R.*

3.10–163 551.521.64

Michigan. University. Engineering Research Institute, **Cosmic ray particles.** Contract AF 19(122)-465, First Quarterly Progress Report, April 1–July 30, **1951.** 2 p. **DWB**—This investigation is concerned with determining a possible correlation between the penetrating component in cosmic rays observed underground and the temperature in the upper third of the atmosphere. Data on the correlation between temperature and height of atmospheric pressure levels at atmospheric pressure levels from 100 to 300 mb are given. Highest correlation obtained at 300 mb. *Subject Headings:* **1. Cosmic ray penetration. I. Contract AF 19(122)-465 I. Hazen, W. E. III. Sherman, Noah.**—*I.L.D.*

3.10–164 551.521.64:523.7

van Allen, J. A. and Singer, S. F., **Cosmic rays and the sun's magnetic field. Apparent absence of low-energy cosmic ray primaries.** *Nature*, London, 170(4315):62–63, July 12, **1952.** table, 10 refs. **Diurnal variation of cosmic rays and the sun's magnetic field.** *Ibid.*, p. 63–64, table, 9 refs. **DWB**—The first paper discusses the nature and variation with latitude of the lowest energy cosmic radiation observed by balloon and rocket, and an apparent cut-off ("knee") below geomagnetic latitude 58°. The second paper discusses the possible existence of a diurnal variation of about 2% due to solar magnetic field. *Subject Headings:* **1. Cosmic ray intensity 2. Solar physics.**—*C.E.P.B.*

3.10–165 551.521.7:612.11

Erneute Nachprüfung der Takata-Reaktion. [Re-investigation of the Takata reaction.] *Umschau*, Frankfurt a.M., 52(12):377, June 15, **1952.** 4 refs. **DLC**—Summary of researches on relation of blood coagulation to certain particle radiations and solar activity. *Subject Heading:* **1. Takata reaction.**—*C.E.P.B.*

TEMPERATURE

(*See also items:* 3.10–95, 3.10–114, 3.10–117, 3.10–144, 3.10–155, 3.10–161, 3.10–162, 3.10–173, 3.10–175, 3.10–202, 3.10–240, 3.10–267, 3.10–271, 3.10–273)

3.10–166 551.524(729.2)

*Pilsbury, R. K., **Some new short term temperature means for eleven stations in Jamaica.** Kingston, Meteorological Office, **1951.** 5 p. 2 graphs, map. **DWB**—Data presented in graphical and tabular form with station location chart and brief annotation. Stations range from sea level to 4900 ft elevation. In addition, extreme temperatures at Blue Mountain Peak (7400 ft) for period 1891–1900 are included and compared with Kingston (33 years of record) data. *Subject Headings:* **1. Temperature data 2. Extreme temperatures 3. Jamaica, B. W. I. I. Jamaica. Meteorological Office.**—*M.R.*

3.10–167 551.524:551.506.3(431)

*†Antonik, Bertold and Branicki, Oskar, **50 jährige Monats- und Jahresmittel der Lufttemperatur in Potsdam. (Übersicht über die Ergebnisse der meteorologischen Beobachtungen in Potsdam. Erste Mitteilung.)** [Fifty-year monthly and annual means of air temperature in Potsdam. (Summary of results of meteorological observations in Potsdam. Pt. 1.)] *Zeitschrift für Meteorologie*, 6(2):44–47, Feb. **1952.** 4 figs., table. **MH-BH**—The article contains curves showing the monthly means of atmospheric temperature for 30-, 50- and 10-year periods; curves showing the deviations of various classes of 10-year temperatures for the 50-year mean temperature; a table giving monthly and annual means of air temperature for the period 1901–50 based upon hourly records; and graphs of the annual mean of air temperature for the 50-year period and of the annual variation of the air temperature (difference between mean monthly maximum and mean monthly minimum for the same period). *Subject Headings:* **1. Temperature 2. Long period records 3. Potsdam, Germany.**—*I.L.D.*

3.10–168 551.524.35

Karapiperis, Photios P., **Interhourly variability of temperature at Blue Hill, Mass.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(1):51–56, **1952.** 6 tables, 4 refs.

English, German, French summaries p. 51. **Interdiurnal variability of temperature at Blue Hill, Mass.** *Ibid.*, p. 57–64. 2 figs., 5 tables, 5 refs. English, German, French summaries p. 57–58. **DWB**—Interhourly falls (C) and rises (W) of temperature at Blue Hill exceeding 3° and 4°F are tabulated for each pair of hours for each season. Rapid warmings predominate especially in winter (advection). Greatest hourly cooling 29°F, 17–18h April 30, 1941, warming 11°F 20–21h June 11, 1943. A similar study of cooling and warming exceeding 20°F between one day and the next (5 h or 14h) shows a mean variability of 9–10°F at 5h in winter and 4–5°F in summer; at 14h change is 7–9°F through the year. Mean length of a temperature surge 3.5 days. *Subject Headings:* **1. Temperature variations 2. Blue Hill, Mass.**—*C.E.P.B.*

3.10–169 551.524.36

*Court, Arnold (*Office Quartermaster General, Wash., D. C.*), **Summer temperatures in the United States.** *Monthly Weather Review*, 80(2):20–25, Feb. **1952.** fig., 2 tables, 5 refs. **DWB**—Percentage frequencies of hourly temperatures above certain values from 40° to 110°F by 5° intervals, are presented for 102 places in the United States in summer (June-July-August). The frequencies are based on hourly readings, generally at airways weather stations during five years 1935–1939. Since average summer temperatures during this period were somewhat warmer than long-term "normals," the resulting tabulation is considered applicable to a "typical warm summer" such that only about 15 summers per century would be warmer. The percentages are presented in a table, and those for temperatures above 85°F (30°C or higher) are shown on a map to indicate the regions where refrigerated storage is desirable for chocolate candy, which turns white ("graying" or "blooming") as soon as its temperature exceeds 85°F. *Subject Headings:* **1. Temperature frequencies 2. Summer temperatures 3. United States.**—*Author's abstract.*

3.10–170 551.524.4:551.589.1(691)

*Emon, Jean, **L'inversion de rayonnement au sol à Tulear.** [The ground level radiation inversion at Tulear.] *Madagascar. Service Météorologique, Publication* No. 19, Oct. **1949.** 65 p. 10 tables, charts, graphs, 3 refs. **DWB**—This essay is taken from "Température et humidité en altitude dans l'Océan Indien Sud-Ouest" [Temperature and humidity aloft in the southwest Indian Ocean], prepared for later publication. The investigation of the ground level radiation inversion is based on data obtained through soundings made by the British in 1943–1945. Various characteristics of morning inversion are analyzed, such as frequencies of temperature, relative and specific humidity, and wind. The correlation between the inversion and such weather phenomena as fog and frontal passages is discussed. The lower atmospheric layers are included in the investigation. *Subject Headings:* **1. Inversions 2. Synoptic climatology 3. Tulear, Madagascar.**—*G.T.*

3.10–171 551.524.7:551.547(417)

Doporto, Mariano (*Dir. Eire Met. Soc. Dublin*), **Vertical motion and divergence computed from upper air variations of pressure and temperature at Valentia.** *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:103–113, **1952.** 11 figs., 7 tables, 14 refs. **MH-BH**—Changes of pressure and temperature at all heights are calculated from 231 pairs of radiosondes at Valentia reaching 18 km on consecutive days. Ascents are classified according to pressure changes at 0, 4, 8, 12, 16 km and average values found. These are used to compute vertical air motion and divergence at different levels, assuming no advection. Results agree with integration of dynamic equations if density change is zero at 8 km. *Subject Headings:* **1. Upper air temperatures 2. Upper air pressure 3. Valentia, Ireland.**—*C.E.P.B.*

3.10–172 551.524.7(267)

*§Emon, Jean, **Altitude de l'isotherme zéro °C dans l'Océan Indien Sud-Ouest.** [Height of the 0°C isotherm in the southwest Indian Ocean.] *Madagascar. Service Météorologique, Publication* No. 16, July **1949.** 87 p. 14 tables, charts, refs. **DWB**—This paper consists of one chapter of "Température et humidité en altitude dans l'Océan Indien Sud-Ouest" [Temperature and humidity aloft in the southwest Indian Ocean], prepared for later publication. Using data obtained through soundings made by the British in 1943–1945, the altitude of the 0°C isotherm is determined and analyzed as to diurnal and seasonal variation, effect of

latitude, etc. Special attention is given to the effect of ground elevations on the lowering of the 0°C level and on icing. Synoptic examples are given. *Subject Headings:* **1. Zero isotherm 2. Upper air temperatures 3. Madagascar 4. Southwest Indian Ocean.**—*G.T.*

SEA TEMPERATURE

(*See also items:* 3.10–43, 3.10–60, 3.10–217)

3.10–173 551.526.6:551.524:551.556(261.3)

†*Hela, Ilmo, **On the energy exchange between the sea and the atmosphere in the Baltic area.** *Helsinki. University. Meteorologian laitos, Mitteilungen*, No. 70, **1951. DWB**—Monograph based on nearly 5000 observations made at 0800 by personnel on the Swedish Light Ship, Finngrundet, between 1923 and 1938, and the temperature observation made for the years 1937–47 under controlled conditions, compared with earlier observations (1923–36) to show the accuracy of the latter. The mean variation of 0.2°C is thought to be small compared with the mean air-sea temperature difference. [KUHLBRODT reports (1936) a systematic error of +0.8°C in the tropics and +0.7°C in subtropics.] An analysis of monthly variations in surface temperatures of the sea, of sea-air temperature difference, of the amount of energy given off by sea surface as sensible heat, as function of wind direction of speed, vapor pressure, evaporation, energy, and total energy loss from sea. (*See also items* 3.4–1 and 3.4–2, April 1952, *MAB.*) *Subject Headings:* **1. Energy exchange between sea and atmosphere 2. Wind effects 3. Evaporative energy 4. Air-sea temperature variations 5. Baltic Sea.**—*M.R.*

3.10–174 551.526.6(265)

*Leipper, Dale F. and Anderson, Ernest R., **Sea temperatures, Hawaiian Island area.** *Pacific Science*, Honolulu, 4(1):228–248, July **1950.** tables, graphs, charts, refs. **DLC**—Results of 5407 bathythermograph measurements made since 1940 in the Hawaiian area of the North Pacific are tabulated and presented graphically to show the average horizontal and vertical distribution of temperature, the amount and distribution of data available, and the variations in surface temperature and lapse rate in the sea on different days and in different years on the same day. Typical bathythermograms are presented, as well as cross sections and isothermal charts for 15°–30°N and 150°–165°W for surface and subsurface levels. *Subject Headings:* **1. Sea temperature data 2. Bathythermographs 3. Hawaiian Island Area 4. North Pacific Ocean.**—*M.R.*

3.10–175 551.526.6:551.524.3

Richter, J., **Über die Bedeutung der Temperaturdifferenz Luft minus Wasser im Wetterdienst und ihre Verschlüsselung.** [On the importance of the temperature difference air-water in the weather service and its coding.] *Wetterlotse*, Hamburg, 40:94–96, May **1952. DWB**—Includes a brief description of the effect of the difference on weather and the 1948 code. *Subject Headings:* **1. Air-sea temperature variations 2. Marine meteorological codes.**—*C.E.P.B.*

3.10–176 551.526.6:551.46

*Robinson, Margaret K., **Sea temperature in the North Pacific area 20°–40°N, 125°–155°W.** California. University. Scripps Institution of Oceanography. Contract N6ori-III, Task VI, [Report], Sept. 15, **1951.** 14+p. 36 figs., 6 tables, 8 refs. **DWB**—This fourth report in a series of studies based on 1941–1950 Navy, Coast Guard and Scripps bathythermograms is an attempt to arrive at the true underlying average temperature picture for the subject area between California and the Hawaiian Islands. Where ample data were available, smoothed curves were derived for each 1° square. Excellent diagrams are included. *Subject Headings:* **1. Sea temperatures 2. Oceanography 3. Pacific Ocean. I. California. University. Scripps Institution of Oceanography II. Contract N6ori-III, Task VI.**—*M.P.K.*

3.10–177 551.526.6:551.508.29(266)

Rudnick, Philip and Cochrane, John D. (*Univ. of Calif.*), **Diurnal fluctuations in bathythermograms.** *Journal of Marine Research*, 10(3):257–262, Dec. 31, **1951.** 2 figs., 3 tables, 10 refs. **DWB**—Periodogram and correlogram analysis of series of bathythermograms ex-

tending over 12 to 90-day periods from two stations in the northeastern Pacific show only slight and indefinite indications of the existence of diurnal or semidiurnal periods in contrast with the diurnal or semidiurnal periods observed in the Atlantic. Fluctuations of sea surface temperatures were found to be about half random and half due to diurnal solar heating. *Subject Headings:* **1. Diurnal sea temperature variations 2. Temperature periodicities 3. Bathythermograms 4. Northeastern Pacific.**—*Based on authors' abstract.*

3.10–178 551.526.6:551.583.13

Vom Nutzen der Wassertemperaturmessung in den nördlichen Meeren. [The uses of water temperature measurements in the northern seas.] *Wetterlotse*, Hamburg, No. 10:1–5, May **1950.** fig. **DWB**—Discusses the effect of warming up of water upon the distribution of useful fishes and contains a graph showing climatic variations on Iceland at 10 year intervals from 1881–1941. *Subject Headings:* **1. Water temperatures 2. Long period records 3. Climatic variations 4. Iceland.**—*I.L.D.*

ATMOSPHERIC PRESSURE AND WIND

PRESSURE

(*See also items:* 3.10–79, 3.10–83, 3.10–118)

3.10–179 551.543.1:550.385

Lewis, R. P. Waldo and McIntosh, D. H., **Atmospheric pressure and geomagnetic disturbance.** *Nature*, London, 169(4312):1059–1060, June 21, **1952.** 2 figs., 2 refs. **DWB**—The relation between diurnal variation of pressure at Aberdeen and magnetic disturbance, found by J. M. Stagg (1931), was tested by using later data. No significant relation was found. *Subject Headings:* **1. Diurnal pressure variations 2. Magnetic disturbances.**—*C.E.P.B.*

3.10–180 551.543.1:551.510.5 550.384.4:551.543.1

Wilkes, M. V., **World-wide oscillations in the earth's atmosphere.** *Royal Meteorological Society, Quarterly Journal*, 78(337):321–336, July **1952.** 9 figs., 27 refs. **DWB**—This general survey describes briefly the 12-hour oscillation of barometric pressure, the small semidiurnal lunar atmospheric tide, and the resulting lunar variations of temperature and of the height of the E region. The resonance theory of the 12-hour wave is discussed, and it is shown that with a low-temperature boundary at about 80 km there are two possible oscillations, one weakening with height, the other with a node at 30 km. The origin of the 12-hour wave (thermal or gravitational) is left open. The dynamo theory of magnetic variations, the lunar tide in the ionosphere, and tidal motion in the F region are briefly discussed. *Subject Headings:* **1. Diurnal pressure variations 2. Lunar diurnal variations 3. Ionospheric tides.**—*C.E.P.B.*

3.10–181 551.543.5:519.241.6

Mayer, R., **Über den Zusammenhang der interdiurnen Veränderlichkeit mit der Dispersion des Luftdruckes.** [On the relation between the interdiurnal variability and the dispersion of pressure.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(1):34–42, **1952.** 2 figs., 19 equations. German, English and French summaries p. 34–35. **DWB**—The mean deviation of hourly pressure is approximately twice the interdiurnal variability over all Europe (map). This relation is shown statistically to be associated with the fact that the mean hourly variability $\bar{u}$ is inversely related to the actual pressure level (at Vienna $\bar{u} = -0.014\ (p - p_0)$ where p_0 is the mean pressure. *Subject Headings:* **1. Interdiurnal pressure changes 2. Statistical studies.**—*C.E.P.B.*

WIND VARIATIONS

(*See also item:* 3.10–137)

3.10–182 551.552:551.555.1

Crowe, P. R., **The trade wind circulation of the world.** *Institute of British Geographers, Transactions and Papers 1949*, No. 15:39–56, [**1951**]. 3 figs., 12 charts, table. **The seasonal**

variation in the strength of the trades. *Ibid.*, 1949, No. 16:25–47 [1951]. 8 figs., 5 tables.—In the first paper the limit of the trade wind is taken as the isoline of (winds force 3 and above in a given quadrant)/all winds = 50%. Monthly world maps of positions of this isoline are given; 90 and 70% isolines are also given and weighted areas calculated monthly for each ocean. These are considered to indicate the annual variation of vigor of the trade circulation. In the second paper, the median wind speeds in each month are calculated for different meridional strips 40°N–40°S and compared with direction summaries in first paper, and air transfer along the equator discussed. Chinese monsoon and Coral Sea trades are examined. Finally, frequency distributions of velocities are plotted and discussed. *Subject Headings:* **1. Trade winds 2. Trade wind variations.**—*C.E.P.B.*

3.10–183 551.553.8(481)

§Mertins, —. **Über Süd- bis Südoststürme bei Svinöy und den Lofoten.** [On south to south-east storms at Svinö and the Lofotens.] *Wetterlotse*, Hamburg, 41:101–108, June 1952. 4 figs. **DWB**—With high pressure over Scandinavia and low over the North Sea there is a strong wind field along the S. Norwegian coast. With the low further north, the strong winds are S. of the Lofotens. The marked wind divides are described. *Subject Headings:* **1. Gales 2. Norway.**—*C.E.P.B.*

3.10–184 551.554:551.571.4:551.521.3

Schüepp, Walter, **Beobachtungen und Überlegungen zum tagesperiodischen Luftmassenaustausch.** [Observations and reflections on the daily periodic air mass exchange.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 5(1):36–43, 1952. 2 figs., 18 refs. German, English, French summaries p. 36–37. **DWB**—Simultaneous measurements of vapor pressure and actinometric determinations of total water vapor at several stations are used to study the diurnal variation of air mass exchange in the Jura-Alps region in summer anticyclones. It is shown that local features such as slope and valley winds, convection and turbulence only affect the lower layers but in 1947 and 1949, with drought in the lowlands and nearly normal precipitation in the mountains, their consequences were economically important. *Subject Headings:* **1. Water content of air 2. Water vapor transport 3. Diurnal wind variations.**—*C.E.P.B.*

SPECIAL WINDS

(*See also item:* 3.10–262)

3.10–185 551.555:551.584.4:551.556.2

Ioganson, V. E. and Obukhov, A. M., **Izuchenie sukhoveev Prikaspiia.** [Investigation of the hot dry winds in the Caspian region (by the Institute of Geography of the Academy of Sciences of the USSR).] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr.*, No. 3:94–95, 1951. **DLC**—The Institute aims to study the cause of hot, dry winds and to devise means of counteracting their effects. In 1951, N. L. Dzerdzeevskiĭ studied gradient temperature, humidity and wind velocities within 10 meters above the ground, soil temperatures and conductivity, micrometeorology of irrigated and nonirrigated areas of wheat, etc. Other scientific investigations were carried out by the Institute of Geography, the Geophyics Institute of the Academy of Sciences of the USSR, etc. Some preliminary measurements of temperature, relative humidity made upon steppe and forested areas are given. *Subject Headings:* **1. Hot dry winds 2. Micrometeorology 3. Caspian region 4. U.S.S.R. I. Institute of Geography of the Academy of Sciences of the U.S.S.R.**—*I.L.D.*

3.10–186 551.555.3

Berg, Hellmut, **Der Föhn im nördlichen Alpen- und Voralpengebiet vom 11. bis 14. März 1951.** [Föhn in northern Alpine and Fore-Alpine region March 11–14, 1951.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:117–124, 1952. 10 figs., table, 7 refs. **MH-BH**—The aerology of the strong föhn of March 11–14 up to 3 km is summarized and the mechanism discussed. Descent into the valleys is attributed to downglide of surface-cooled mountain air. Characteristics of the true föhn are discussed and a föhn scale (0–2) proposed. *Subject Headings:* **1. Föhn winds 2. Alps.**—*C.E.P.B.*

3.10–187 551.555.3:797.5

Jucker, W., **Ein Föhnsturm, im Fluge erlebt.** [A Föhn storm experienced in flight.] *Leben und Umwelt*, Basel, 8:169–170, May 1952. fig. **DLC**—Account of a glider flight April 18, 1950, from Zurich in which a height of 5400 m was reached in the ascending branches of turbulent waves in the föhn. These were marked by dark whirling clouds, while the descending branches were clear. *Subject Headings:* **1. Föhn storms 2. Gliding.**—*C.E.P.B.*

3.10–188 551.555.4:551.515.4(494)

Bouët, Max, **La vaudaire d'orage du 11 juin 1950.** [The Vaudaire thunderstorm on June 11, 1950.] *Société Vaudoise des Sciences Naturelles, Lausanne, Bulletin*, 65(278):33–40, **1951.** graph, 3 refs. **DWB**—A detailed treatment of a case of violent thunderstorm "Vaudaire" winds which occurred in the evening of June 11, 1950 in the Bas-Valais which opens into the Lake of Geneva. The wind was attributed to a marked local increase in pressure which in turn was caused by cooling in the thunderstorm area. This cooling amounted to as much as 9.4°C at Montana and 6°C elsewhere in the vicinity. No trace of föhn was noted, since pressure was higher to the north than to the south of the Alps. Abstract of briefer account of this phenomenon was published in *MAB* 2.5–115, May 1951. *Subject Headings:* **1. Vaudaire 2. Katabatic winds 3. Thunderstorms 4. Lake Geneva 5. Rhone Valley, Switzerland.**—*M.R.*

WIND EFFECTS

(*See also items:* 3.10–173, 3.10–185, 3.10–210, 3.10–217, 3.10–278)

3.10–189 551.556:629.13

Hage, Robert E., **Variation in airplane range with wind velocity.** *Aeronautical Engineering Review*, 10(7):18–22, July **1951.** graphs, ref. **DLC**—Equations representing the effect of wind on the increase or decrease of range of various type aircraft are developed and presented in graphs. Results of the calculation are claimed to be sufficiently accurate for use in practical computation of the effect of wind velocity on airplane range and best cruising speed. *Subject Headings:* **1. Aerial navigation 2. Upper air winds 3. Wind utilization.**—*G.T.*

3.10–190 551.556:551.465

Hansen, Walter, **Winderzeugte Strömungen im Ozean.** [Wind-caused ocean currents.] *Deutsche Hydrographische Zeitschrift*, 4(4–6):161–172, **1951.** 11 figs., 15 refs., 10 equations. German, English and French summaries p. 161. **DWB**—The method of boundary values for calculating the volume transport of water by ocean currents from a known wind field is described. It is applied to the Atlantic (40°N–40°S) in August, giving lines of amount and direction of water transport and topography of sea surface. *Subject Headings:* **1. Ocean currents 2. Wind effects 3. Atlantic Ocean.**—*C.E.P.B.*

3.10–191 551.556:551.464

Kändler, R., **Der Einfluss der Wetterlage auf die Salzgehaltsschichtung im Übergangsgebiet zwischen Nord- und Ostsee.** [The influence of the weather situation on the salinity stratification in the transition region between the North Sea and Baltic.] *Deutsche Hydrographische Zeitschrift*, 4(4–6):150–160, **1951.** 8 figs., table, 11 refs. German, English and French summaries p. 150–151. **DWB** Between Denmark and Sweden there is a relatively fresh surface flow toward the North Sea and a more saline underlying inflow into the Baltic. From soundings at 7 lightships, salinity profiles are drawn showing average conditions in Jan. and May, summer anticyclonic conditions (sharp discontinuity), and turbulent inflow with W. winds and outflow with E. winds; the effects are also shown schematically. In spring 1937, an extensive outflow due to a period of stormy E. winds was followed by a great irruption of North Sea water. *Subject Headings:* **1. Salinity 2. Wind effects 3. Baltic Sea 4. North Sea.**—*C.E.P.B.*

3.10–192 551.556:551.465

Keulegan, Garbis H., **Wind tides in small closed channels.** *U. S. National Bureau of Standards, Journal of Research*, 46(5):359–381, May **1951.** 33 figs., 7 refs., 87 equations.

DLC—This paper presents the theoretical background and experimental results concerned with the wind produced "mass transport (called wind tide or set-up) in a body of water resulting in the lowering of the level at the windward side and rise at the leeward side. Two effects of the wind are involved: the surface traction on the water and the form resistance of the waves. The derived empirical formula for set-up is compared with observations in Lake Erie." *Subject Headings:* **1. Wind tides 2. Wind driven currents 3. Water level variations.**—*Author's abstract.*

3.10–193 551.556:551.465:551.509.39(261)(262)

MacDougal, Frank, **Correlation of heights of observed and computed deep-water wind waves in North Atlantic Ocean and Mediterranean Sea.** *American Geophysical Union, Transactions,* 32(6):878–880, Dec. **1951.** fig., table, 3 refs., equations. **MH-BH**—The SVERDRUP-MUNK method of forecasting height of wind waves by graphically relating wind speed and duration is tested on 650 representative observed values of deep water waves. Considering the numerous possible sources of error, the coefficients of correlation, ranging from .81 to .91, were surprisingly high and indicated that "hindcasting" of wave heights for statistical studies is valid. *Subject Headings:* **1. Wind waves 2. Wave heights 3. Wave forecasting 4. Deep water waves 5. North Atlantic Ocean 6. Mediterranean Sea.**—*M.P.K.*

3.10–194 551.556:551.465(797)

O'Brien, Morrough P., **Wave measurements at the Columbia River Light Vessel, 1933–1936.** *American Geophysical Union, Transactions,* 32(6):875–877, Dec. **1951.** 3 tables, 2 refs. **MH-BH**—Dimensions and periods of deep water waves, relation of wind speed to average ratio of length to height and wave direction were observed 1933 to 1936 at the Columbia River Light Ship. Measurements were adjusted to account for the effects of superposition on wave heights, lengths and periods. On the basis of observed wave direction weighted according to wave heights associated with each direction, it was found that the waves which would most likely account for beach erosion were striking the beach almost perpendicularly. From this it was concluded that erosion in the observed case was due to wind rather than waves. *Subject Headings:* **1. Wave mechanics 2. Ocean wave measurements 3. Wind waves 4. Deep water waves 5. Beach erosion 6. Columbia River Lightship.**—*M.P.K.*

3.10–195 551.556:551.311.1(485)

Werenskiold, Werner, **Vind og Breer.** [Wind and glaciers.] *Svensk Geografisk Årsbok,* Lund, 25:128–129, **1949.** In Swedish; English summary p. 129. **DLC**—Contrary to established belief that snow blows across mountain ridges and accumulates on the lee to form glaciers or snow fields, the author's observations during 7 summers in Spitsbergen were that snow comes with a SE wind and that glaciers are more developed on the E sides. With a west wind, fog and drizzle prevail. Glaciers in Spitsbergen are all receding and precipitation and temperatures are higher than in former years. The difference has been felt more in lower than in more elevated regions. In the latter the increased snow precipitation balances the warming. *Subject Headings:* **1. Glacial ablation 2. Glacier formation 3. Warming of Arctic 4. Wind effects 5. Spitsbergen.**—*M.R.*

UPPER AIR WINDS

(*See also items:* 3.10–33, 3.10–40, 3.10–64, 3.10–112)

3.10–196 551.557:551.513.2

Hurst, G. W., **The profile of a jet stream observed 18th January 1952.** *Royal Meteorological Society, Quarterly Journal,* 78(338):613–615, Oct. **1952,** fig. Revised from: *Great Britain. Meteorological Research Committee, MRP* 722, April 8, **1952.** 3 p. 3 figs. **DWB**—On June 18, 1952, an aircraft flew at 30,000 ft from Yarmouth to Pembroke and back on a more southerly track, crossing a well marked northerly jet stream. Vertical photos were taken every 12 seconds; the winds calculated from these fixes are presented in diagrams. They show a rapid increase from 80 knots in long. 0° to nearly 180 between $2\frac{1}{4}$ and 3°W, and a slow decrease to 160 knots in 5°W. *Subject Heading:* **1. Jet stream.**—*C.E.P.B.*

3.10–197 551.557:551.513.2

Krishna Rao, P. R. (*Met. Center, Madras, India*), **Probable regions of "jet" streams in the upper air over India.** *Current Science*, Bangalore, 21(3):63–64, March **1952.** fig., 7 refs **DWB**—Curves of mean temperature and mean zonal west and east components of winds (as determined from pilot balloon ascents), along 78°E up to an altitude of 20 km are presented for summer and winter. It is found that jet streams in India are most likely to occur between 5°N and 18°N at altitudes of 16 to 18 km in summer (easterly jet) and between 22°N and 32°N at 12 to 14 km in winter (westerly jet). It is pointed out that while the westerly jet has been studied by several authors, the existence of the easterly jet has not been reported so far *Subject Headings:* **1. Jet stream 2. India.**—*G.T.*

3.10–198 551.557:551.513:656.7

Namias, Jerome, **Meteorology in navigation.** *Institute of Navigation, Los Angeles, 7th Annual Meeting, New York City, 1951*, The sciences in navigation. p. 62–74. [n.d.] charts diagrs., refs. **DWB**—Elements of upper air circulation are discussed in general terms with explanatory charts. Regular properties and seasonal and irregular variations of jet streams are explained. Direct and indirect effect of circulation in the vicinity of the tropopause on aviation is mentioned. *Subject Headings:* **1. Aeronautical meteorology 2. Upper air circulation 3. Jet stream.**—*G.T.*

3.10–199 551.557.2:551.542

James, R. W., **Physical significance of mean flow charts.** *Meteorological Magazine* London, 81(956):42–48, Feb. **1952.** equations. **DWB**—Vector equations of horizontal air motion and acceleration are set out and assessments made of isallobaric, coriolis and "spatial" acceleration terms from daily charts for May 1948. It is found that in free air mean geostrophic wind for month represents mean actual wind with a vector error of −1 knot. The most important ageostrophic component is the cumulative cyclostrophic wind. *Subject Headings:* **1. Flow charts 2. Geostrophic winds.**—*C.E.P.B.*

3.10–200 551.557.2:551.510.535

Maxwell, A. and Little, C. G., **A radio-astronomical investigation of winds in the upper atmosphere.** *Nature*, London, 169(4305):746–747, May 3, **1952.** 3 figs., 3 refs. **DWB** Review by: Groen, P., in *Hemel en Dampkring*, 50(7/8):130–131, **1952.** fig., refs., **DWB**— Measurements of irregularities in radiation (80 Mc/s) from radio stars at 3 stations give winds in F layer at night. Histograms of direction and speed show, May–June, 60°N, nearly all towards W–WNW, mean speed 250 km/hr; Sept.–Oct., 53°N, towards W–WSW, 430 km/hr. Rapid changes of speed observed. *Subject Heading:* **1. Ionospheric winds.**—*C.E.P.B.*

3.10–201 551.557.2:551.501.7(469

*Morais, José Custódio de (*Univ. Coimbra, Dir. Instituto Geofísico*), **Balões pilotos em Coimbra.** [Pilot balloon observations at Coimbra.] *Coimbra. Universidade. Faculdade de Ciencias, Revista*, 20, **1951.** 19 p. 4 figs., 9 tables, 13 refs. In Portuguese, French summary p. [20]. Abstracted from reprint. **DWB**—Seasonal upper wind roses, data and discussion based on 533 observations made by pilot balloon at Coimbra during 1950 and 1951. Data also given for 700 and 500 mb level. Analysis of data shows sea breeze effects in summer, "monsoon" effects in summer and winter, the relation between wind and current temperature, rotation of resultant winds with height and statistical representativeness of sample as a measure of the prevailing conditions. A new type of wind rose is presented to show the relation between statistically "correct" distribution of wind direction, speed and frequency, and that observed. *Subject Headings:* **1. Upper air winds 2. Wind roses 3. Pilot balloon observations 4. Coimbra, Portugal.**—*M.R.*

VERTICAL MOTION

(*See also items:* 3.10–4, 3.10–224, 3.10–227, 3.10–246)

3.10–202 551.558.1:551.524.

Byzova, N. L., **Samovozbuzhdaiushchiesia kolebaniia potoka teplovoĭ konvektsii.** [Self-induced oscillations in thermal convection currents.] *Akademiia Nauk, SSSR, Izvestiia*

Ser. Geofiz., No. 5:84–92, Sept.–Oct. 1951. 8 figs., 3 refs. **DWB**—An experimental investigation to determine whether regular oscillating processes can arise in thermal convection currents and can persist over long intervals of time. Convective currents were produced in a closed rectangular vessel by heating one side of the bottom and cooling the other. Even when heat was applied constantly to one end, self-induced oscillation of temperature and of current velocity with a period of several minutes and with constant amplitude were observed. The temperature was measured by thermocouples attached to a mirror galvanometer and the velocity by a ball heavier than the water and attached to the glass by a thread. The structure and characteristics of the self-induced waves are described and experimental data are presented to show that they depend upon the shape of the vessel (greater horizontal than vertical interiors), low viscosity of the water and upon temperature gradient between heated and cooled ends. The period of oscillation is equal to the mean period of the convection current and the oscillation spreads with the current. *Subject Headings:* **1. Convection currents 2. Temperature oscillations 3. Experimental meteorology.**—*I.L.D.*

3.10–203 551.558.1:632.7

Rainey, R. C. and Waloff, Z., **Flying locusts and convection currents.** *Anti-locust Bulletin*, London, 9:51–70, 1951. 2 tables, 38 refs. **DLC**—Intensity of convection in E. Africa was estimated graphically on a tephigram from surface observations and cloud structure and compared with structure and flying height of locust swarms. Results confirmed by some direct observations. In up-currents of 500 ft/min swarms were cumuliform and with much milling and some gliding; without convection swarms were stratiform. Frequency of vertical currents in Somalia was determined by tail balloons and compared with swarm structure. Effect of rain on convection discussed. *Subject Headings:* **1. Convection currents 2. Locusts.** —*C.E.P.B.*

3.10–204 551.558.1:532.59(47)

Shuleĭkin, V. V., **Skhema kolebaniĭ rezhima v konvektsionnom potoke.** [A scheme of the regime of fluctuations in a convection current.] *Akademiia Nauk, SSSR, Doklady*, 82(2):241–244, **1952.** 3 refs., 15 equations. **DLC**—Experimental observations of N. L. Byzova reported in 1951 article (abstracted as item 3.10–202 above) on the origin and behavior of the spontaneous fluctuations arising in convection currents within rectangular vessels filled with water and heated unequally are generalized into a theoretical scheme applicable to a study of the advection currents in the atmosphere. The type of relationship between heat advection and current velocity which gives rise to spontaneous oscillation is analyzed mathematically; equations by means of which it is possible to calculate the period of oscillations are derived; and theoretical and observational calculations are compared. *Subject Headings:* **1. Convection currents 2. Advection 3. General circulation theory 4. Hydrodynamics 5. Experimental meteorology 6. U.S.S.R. I. Byzova, N. L.**—*I.L.D.*

3.10–205 551.558.2:551.511

Kiveliovitch, M., **Sur la composante verticale du vent.** [On the vertical component of the wind.] *Journal Scientifique de la Météorologie*, 3(12):131–136, Oct./Dec. **1951.** equations. French, English and Spanish summaries p. 131. **MH-BH**—An elaborate development of the equation of continuity for the nongeostrophic case, substituting $u=u'+ug$, $V=v'+Vg$, $w=w'+wg$. Particular cases treated are: 1) constant density $\rho=C$, 2) barotropic flow, $\rho=\phi(p)$. *Subject Headings:* **1. Vertical motion 2. Nongeostrophic winds.**—*M.R.*

3.10–206 551.558.21:797.5

Roper, R. D., **Evening waves.** *Royal Meteorological Society, Quarterly Journal*, 78(337): 415–418, July **1952.** 4 figs., 2 refs. Appendix: **Conditions favourable for lee waves and orographic disturbance at great height.** By R. S. Scorer. *Ibid.*, 418–419. fig., 2 refs. **DWB**—At Camphill SW of Sheffield, Yorkshire, and other valleys, gliders often find the best lift in the evening, after a warm sunny day. An example is described; the lift is attributed to the windward side of a lee wave crest. The meteorological situation is analyzed by R. S. Scorer. *Subject Headings:* **1. Lee waves 2. Gliding. I. Scorer, R. S.**—*C.E.P.B.*

3.10–207 551.558.2

Scorer, R. S., **Recent advances in science. Meteorology. Airflow over mountains** *Science Progress*, London, 40(159):466–477, July 1952. 11 figs., 2 photos, 12 refs. **DWB**— An account is given of observations of lee waves behind mountain ridges. Applications of th equations of motion of a stably stratified air stream are summarized with cross sections describing theories of LYRA, QUENEY and SCORER. FÖRCHTGOTT's five types of barostromati (gravity stratification) flow (laminar, standing eddy, wave, and two types of rotor streaming are illustrated. Some remarks on fictitious inversions and orographic rainfall are included *Subject Headings:* **1. Lee waves 2. Lee eddies.**—*C.E.P.B.*

3.10–208 551.558.2

Zierep, J., **Leewellen bei geschichteter Anströmung.** [Lee waves in a stratified current. *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:85–90, 1952. 15 figs., 1 equations. **MH-BH**—A two-dimensional equation is developed for a confluent up-curren approaching an obstacle. From the solution the stream lines are deduced for different profiles *Subject Heading:* **1. Lee waves.**—*C.E.P.B.*

3.10–209 551.558.29:551.515:551.509.31

Bushby, F. H., **The evaluation of vertical velocity and thickness tendency from Sutcliffe' theory.** *Royal Meteorological Society, Quarterly Journal*, 78(337):354–362, July 1952. 5 figs 19 equations, 8 refs. **DWB**—The field of mean vertical velocity in the 1000–500 mb layer du to large scale atmospheric systems was computed by the development equation of SUTCLIFFE including the effect of vertical stability and effect on rate of rainfall. Of 6 analyses that c Feb. 14, 1950 (warm front) is shown in charts. Good first approximations were obtained *Subject Headings:* **1. Vertical velocity 2. Upper air analysis.**—*C.E.P.B.*

AQUEOUS VAPOR AND HYDROMETEORS

(*See* Bibliography on Glaze and Rime, p. 1066–1101)

EVAPORATION

3.10–210 551.573:551.571.7:551.556(77

Johns Hopkins University. Dept. of Civil Engineering, **Water vapor transport projec** Contract AF 19(122)-365, Quarterly Report No. 2, March 15, 1951; and Technical Repo No. 1, *on* **The water balance of the Ohio River Basin for 1949.** By Robert L. Carnahan an George S. Benton. Baltimore, March 15, 1951. 41 p. **DWB**—Due to delay in receip of the deck of 130,000 punched cards (radiosonde data) for calculating upper air transport water vapor, the time during this quarter was spent in computing geostrophic winds fro WBAN weather charts for subsequent transcription on punched cards. Part II contain a study of the climatic and hydrologic characteristics of the Ohio River Basin, specific cond tions during 1949 in that Basin, evapotranspiration during 1949, and application of evap transpiration formulas to the Ohio Basin. Finally, an estimate is made of the monthly evap transpiration from the Ohio watershed during 1949. *Subject Headings:* **1. Evapotranspiratio 2. Water vapor transport 3. Ohio River Basin. I. Benton, George S. II. Carnahan, Robert III. Contract AF19(122)-365.**—*M.R.*

3.10–211 551.5

Möller, Fritz, **Zur Bestimmung der Gebietsverdunstung aus der Advektion.** [Dete mination of regional evaporation from advection.] *Germany. Deutscher Wetterdienst in d US-Zone, Berichte* No. 35:172–173, 1952. table, 4 equations, ref. **MH-BH**—From radi sondes 1949–50 at Schleswig, Iserlohn and Berlin, the dew point gradients over N.W. Germa were found at 1000, 850, 700 and 500 mb and the difference evaporation-precipitation calculat for each season. The mean precipitation being known, the regional evaporation is calculat (year 776 mm). *Subject Headings:* **1. Evaporation measurement 2. Northwest Germany.** *C.E.P.B.*

3.10–212 551.573:551.579.5:581.

Molga, Marian, **O potrzebie znajomości nauk przyrodniczych przy rozwiazywaniu zaga nienia bilansu wodnego kraju.** [On the need for a knowledge of the natural sciences for sol

tion of problems of the country's water balance.] *Gazeta Obserwatora PIHM*, Warsaw, 4(3):9–11, March **1951.** refs., table. **DLC**—The need of a thorough knowledge of soil structure (its water retention properties) and of an evaluation of the quantity of water consumed by plants on a certain surface by transpiration is stressed and the processes explained. *Subject Headings:* **1. Hydrology 2. Evapotranspiration 3. Poland.**—*A.M.P.*

3.10–213 551.573

*†Reichel, Eberhard, **Der Stand des Verdunstungsproblems.** [The present status of the evaporation problem.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:155–172, **1952.** 2 tables, 110 refs. **MH-BH**—A comprehensive summary of the problems and results of evaporation measurement and estimation over land and sea. For land, rainfall is known and a new determination of runoff is made, the difference is annual evaporation; direct measurement by lysimeter and calculation from heat or radiation balance may give monthly values. At sea, evaporation can be measured more accurately than precipitation, but direct measurements on ships are uncertain; heat balance may give better results. Much material is considered and a table summarizes results for land areas and Atlantic. A long discussion followed. *Subject Heading:* **1. Evaporation data.**—*C.E.P.B.*

3.10–214 551.573:551.579.5

Schubach, Karl, **Verdunstungs- und Wasserhaushaltsuntersuchungen an verschiedenen Böden.** [Evaporation and water economy investigations in different soils.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:189–193, **1952.** 4 figs., 2 tables, 3 refs. **MH-BH**—At Giessen daily measurements of evaporation, soil moisture and percolation down to 25 cm were made in 1950/51 with Popoff evaporimeter and small Russian lysimeter, in sand, loess and humus. The results are summarized and discussed in detail. *Subject Headings:* **1. Evaporation 2. Soil moisture 3. Percolation.**—*C.E.P.B.*

3.10–215 551.573

Steinhäusser, Hans, **Über die Gebietsverdunstung in den österreichischen Südalpen.** [On the regional evaporation in the Austrian southern Alps.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:174–179, **1952.** 5 figs., table, 4 refs. **MH-BH**—Author discusses the difficulties of estimating evaporation from rainfall and runoff in mountain areas and then gives values for the rivers of the Drava region. He compares these with values found by other workers and with those given by $V=0.143\,N+69.0t+52.5$ (V=evaporation mm, N=rainfall, t=regional temperature). Relation of V to height is compared with that in Swiss Alps. *Subject Headings:* **1. Evaporation 2. Austrian Alps.**—*C.E.P.B.*

3.10–216 551.573:551.579.5

Uhlig, Siegfried, **Die Abschätzung der Bodenverdunstung an Hand von Bodenfeuchtemesswerten.** [Determination of soil evaporation by soil moisture measurements.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 35:182–189, **1952.** 7 figs., 2 tables, 16 refs. **MH-BH**—Author develops a method of estimating evapotranspiration from measurements of soil moisture with corrections for runoff and percolation. *Subject Headings:* **1. Evapotranspiration 2. Soil moisture.**—*C.E.P.B.*

3.10–217 551.573:551.556:551.526.6

Zubov, N. N., **Nekotorye osobennosti ispareniia v more.** [Some characteristics of evaporation from seas.] *Voprosy Geografii, Sbornik*, No. 24, *Fizicheskaia Geografiia*, 1951. p. 380–392. refs. **DLC**—A very lucid qualitative discussion of the process of evaporation from large water surfaces. Evaporation is either physical or mechanical. The former involves a loss of heat by the evaporation surface; the latter does not lead to a decrease in surface temperature but is caused by wind action. The mechanism of mechanical evaporation is described and its role in the total evaporation process, in the distribution of atmospheric salts, its effect on the chemical composition of the Sea of Aral and of the Caspian Sea are discussed. The author believes that mechanical evaporation is more important than physical evaporation and lists the regions where this is particularly true. *Subject Headings:* **1. Evaporation theory 2. Water temperatures 3. Saline nuclei 4. Wind effects 5. Central Asia 6. Caspian Sea 7. Aral Sea.**—*I.L.D.*

CLOUDS

(*See also item:* 3.10–76)

3.10–218 551.576:551.521.1

*Petrovič, Štefan, **Oblačnosť a slnečný svit v Bratislave.** [Cloudiness and insolation a Bratislava.] *Czechoslovakia. Štátní Hydrologický a Meteorologický ústav v Bratislave, Pu likácie,* [n. d.] p. 26–40. 15 tables, 11 refs. In Slovak; French summary p. 40. **DWB**— Elaborate contingency tables of frequency of clear days, cloudy days, clear spells, cloud spells, hours with sunshine and other mean cloudiness or insolation data for Bratislava fo 1901–1940 are presented and discussed in detail. History of observations at that plac methods of statistical analysis, annual march of mean cloudiness, frequency of cloud amoun (0–10), etc., also included. *Subject Headings:* **1. Cloudiness 2. Insolation 3. Bratislav Czechoslovakia.**—*M.R.*

3.10–219 551.576.1:551.577.1(0

Affronti, Filippo. **La "Nuvola pendente" discorso meteorologico nel "Museo di fisic e di esperienze."** [The "Nuvola pendente" meteorological discourse in "Museo di fisica e esperienze."] *Rivista di Meteorologia Aeronautica,* 10(4):17–23, Oct.–Dec. **1950.** 2 fig Italian, French, English and German summaries p. 17. **MH-BH**—A treatise written in th time of TORRICELLI (1697) in Venice by GIOVAN BATTISTA HODIERNA, on the origin of cloud rainfall, snow, ice, etc. This work shows remarkable insight into the initial, the effective, th formal and the final causes of these phenomena at least 50 years prior to any other simila treatise (such as ANDREA CASPRIDES—**"De Nature et Origine Nebularum"**). Photograph reproduction of the title page and index of contents are presented. *Subject Headings:* **1. Histor of meteorology 2. Cloud physics. I. Hodierna, Giovan Battista.**—*M.R.*

3.10–220 551.576.1:551.501.3:551.585

Bryson, Reid A., **A cloudform-stability scale for tropical oceanic areas.** *America Meteorological Society, Bulletin,* 32(4):146–150, April **1951.** 4 figs., 2 tables, 2 refs. **MH-BH**— The morphological characteristics of the diurnal variations of oceanic and continental cumuli cloud conditions are the result of vertical convergence operation on a conditionally unstab air mass. The typical oceanic sequence of cumuliform clouds, assuming an initial conditio of strong horizontal divergence in the lower troposphere is analyzed and described and a te point scale for rating convective cloud forms in terms of their degree of convective ability presented. *Subject Headings:* **1. Cumulus clouds 2. Cloud classification 3. Cloud stabili scale 4. Tropical clouds.**—*I.L.D.*

3.10–221 551.576.1:551.576

Fletcher, R. D. and Sartor, Doyne (*Hq. Air Wea. Serv., Wash., D. C.*), **Cirrus.** *Weatherwis* 5(1):8–9, Feb. **1952.** 2 figs. **DWB**—Results of an analysis of pilots' reports indicate tha cirrus is usually more extensive, thicker and higher than reported by observers on the groun and is complicated by haze layers and change from night to day. Bottoms of cirrus layers a usually more ragged than tops. The tops often coincide with base of an inversion laye Sometimes marked turbulence occurs in cirrus clouds, and this may be anticipated in area where curved tails appear. Statistics on heights of cirrus bases and tops reported by pilo indicate inverse relation to latitude in general, and wider range of height (20 to 40 thousan feet) at 30°–35°N than at 45°–40°N. Base temperatures range from −15° to −55°C (most −15° to −30°). *Subject Headings:* **1. Cloud observation 2. Cloud height 3. Cirrus clou 4. Pilot reports.**—*M.R.*

3.10–222 551.576

Malkus, Joanne Starr, **Recent advances in the study of convective clouds and the interaction with the environment.** Woods Hole Oceanographic Institution, Contract N6 on 27702, Technical Report No. 16, Sept. **1951.** 53 p. 6 figs., bibl. p. 48–51. Also in: *Tellu* 4(2):71–87, May **1952. DWB**—"Various originating impulses for cumulus formation a mentioned and how the character of this impulse affects the spacing, scale and temperatu structure of the clouds. The possible origins of trade cumuli are considered. Resistive forc

which operate against cloud growth, are shown to be of importance in the transports of momentum, moisture and heat and to serve as controls in the feeding of latent energy into the high tropical troposphere." *Subject Headings:* **1. Cloud physics 2. Cloud formation. I. Woods Hole Oceanographic Institution II. Contract N6 onr-27702.**—*Author's abstract.*

3.10–223 551.576.1:551.509.1(02)

Netherlands. (K.) Meteorologisch Instituut, **Wolken, wolkencodes, hydrometeoren, wolkenatlas. Bewerkt naar de Internationale Wolkenatlas van de Internationale Meteorologische Organisatie.** [Clouds, cloud codes, hydrometeors, cloud photographs. Based on the International Cloud Atlas of the International Meteorological Organization.] 2nd ed. 's-Gravenhage, Staatsdrukkerij Uitgeverijbedrijf, **1948.** 44 p. 44 plates (part col.). **DLC**—Revision of 1941 edition in the light of the 1946 and 1947 IMO Cloud Commission decisions as to cloud codes and specifications. Colored illustrations taken from the International Cloud Atlas, as well as specifications for cloud types and codes and hydrometeor codes, have titles and text in Dutch. *Subject Headings:* **1. Cloud atlases 2. Cloud codes 3. Hydrometeors 4. Dutch language 5. Manuals.**—*M.R.*

3.10–224 551.576.11:551.558.21

Whites Aviation Ltd., New Zealand, **Lenticular lee-wave cloud over New Zealand.** *Meteorological Magazine*, London, 81(956):57–58, Feb. **1952.** photo. **DWB**—Photo from 9000 ft of a remarkable cloud form in lee of mountains of South Island, caused by a strong NW wind, and discussion of origin and structure. *Subject Headings:* **1. Cloud formation 2. Lee waves 3. South Island, New Zealand.**—*C.E.P.B.*

3.10–225 551.576.11

Woodley, K. E., **A note on billow clouds.** *Weather*, 7(5):148–149, May **1952.** 2 figs., plate, 2 refs. **DWB**—Account of cloud rolls observed from North Kew on Sept. 3, 1951, with photos and radiosonde. Static instability and shear were present below an inversion. The cloud rolls were perpendicular to the vertical component of shear. *Subject Heading:* **1. Stratocumulus.**—*C.E.P.B.*

3.10–226 551.576.12:77

Cumulonimbus clouds over Lake Victoria. *Meteorological Magazine*, London, 80(954):367, Dec. **1951.** 2 photos. **MH-BH**—Typical CuNb clouds over N.W. shores of Lake Victoria on Nov. 18, 1941. *Subject Headings:* **1. Cumulonimbus clouds 2. Lake Victoria, East Africa.**—*C.E.P.B.*

3.10–227 551.576.12:551.558.21:551.577.51(45)

Mennella, Cristoforo, **Sulle formazioni nuvolose dell'Epomeo (Isola d'Ischia).** [On the cloud formations on Mt. Epomeo (Isle of Ischia).] *Rivista di Meteorologia Aeronautica*, 7(4):24–29, Oct.–Dec. **1950.** fig., tables. Italian, French, English and German summaries p. 24. **MH-BH**—Observations made for 7 years (1944–50) on the winds and cloudiness on Mt. Epomeo, are analyzed and the meteorological and orographic conditions are described fully. The stationary cloud forms in the lee of the summit (789 m elevation) and extends for many miles toward the continent under certain conditions. Rainfall conditions under various types of air flow and on the various aspects of the mountain are discussed on the basis of numerous rainfall observations (and vegetation), showing that the heaviest rainfall occurs on the NE, and the lightest on the S and SW slopes, though the rain bearing winds are SW. *Subject Headings:* **1. Banner clouds 2. Rainfall regime 3. Orographic effects 4. Mt. Epomeo, Ischia 5. Italy.**—*M.R.*

PRECIPITATION

(*See also items:* 3.10–47, 3.10–50, 3.10–88, 3.10–89, 3.10–93, 3.10–119, 3.10–219, 3.10–227, 3.10–264, 3.10–270)

3.10–228 551.577:551.501

Weiss, Leonard L., **Estimating missing precipitation amounts from recorded amounts at nearby stations.** U. S. Weather Bureau [Dec. 1951.] 10 p. 3 tables, 4 equations. Manu-

script. **DWB**—A method of climatological treatment for adjusting precipitation records For this study, 20 sets of stations consisting of a central station, for which the estimate o missing precipitation was desired and 3 nearby stations (where the records were complete were selected. If the relationship between the amounts recorded at the latter stations an that at the station for which the estimate is desired are known, the estimate can be made fro this relationship by using the following regression equation: $P_0=a'+b_1'P_1+b_2'P_2+b_3P_3$. P is the precipitation to be estimated, P_1, P_2 and P_3 are amounts of precipitation recorded a nearby stations and a', b', b_2' and b_3' are constants or coefficients to be determined. Al stations used in the study were in relatively flat country and the precipitation record for eac set included 60 rain periods from May to September. *Subject Headings:* **1. Precipitatio estimation. I. U. S. Weather Bureau.**—*M.L.R.*

3.10–229 551.577.2:581(55

Bobek, Hans, **Beiträge zur klima-ökologischen Gliederung Irans.** [Contributions to th climatic-ecological classification of Iran.] *Erdkunde*, Bonn, 6(2–3):65–84, June **1952.** 6 figs. fold. chart, 3 tables, 34 refs. **DLC**—The scanty climatic data are supplemented by determina tions of snow line, dry-limit of agriculture, and especially reconstruction of forest areas t present a true picture of the rainfall distribution. Forests are classified and mapped in detail Maps and tables include mean annual rainfall, seasonal rainfall types, number of months wit less than 10 mm, upper limits of date palm and present snow line. The rainfall and vegetatio charts are combined in an ecological-climatic map, ranging from desert and mountain to full tropical types. Monthly rainfall averages are given for 67 stations. *Subject Headings* **1. Rainfall distribution 2. Ecology 3. Iran.**—*C.E.P.B.*

3.10–230 551.577.21(4438

*Lecolazet, R., **Les précipitations atmosphériques en Alsace et Lorraine. Moyenne pluviométriques, 1911–1940.** [Precipitation in Alsace and Lorraine. Rainfall means 1911 1940.] *Strasbourg. Université. Institut de Physique du Globe, Annales, New Ser., Pt. 3 Géophysique*, 6:91–100, **1950.** chart, tables, refs. **DWB**—Tables give monthly and annua mean rainfall for 45 stations in Lorraine, the Rhine Valley and Alsatian Jura, and the Vosges for the periods 1911–20, 1921–30, 1931–40 and 1911–1940, to supplement a study made b E. WAGNER for the same area for the period 1891–1910. Local variations and the variou regimes are described. Isohyets are drawn on the basis of these data, the topography an the ratio between the 1891–1910 and 1911–1940 data. *Subject Headings:* **1. Precipitation dat 2. Precipitation distribution 3. Topographic effects 4. Alsace-Lorraine, France. I. Wagne E.**—*M.R.*

3.10–231 551.577.21:551.513(266

Yeh, Tu-cheng, Carson, James E. and Marciano, Joseph J., **On the relation between th circumpolar westerly current and rainfall over the Hawaiian Islands.** *Meteorological Mono graphs*, Boston, 1(3):47–55, June, **1951.** 13 figs., 8 refs. **MH-BH**—The frequency distributio of the position, maximum shear, and velocity of the jet stream over the western Pacific at 70 mb are studied. These factors are correlated with the Hawaiian rainfall. The rainfa increases with the latitude of the jet. It also increases with the amount of the anticycloni shear south of the westerlies and decreases as the speed of the jet increases. *Subject Headings* **1. Jet stream 2. Rainfall 3. Pacific Ocean 4. Hawaiian Islands.**—*Authors' abstract.*

3.10–232 551.577.3:551.577.2:551.588.2(234.3)(45

*Barbieri, Giuseppe, **Le precipitazione nel gruppo del Gran Paradiso.** [Rainfall in the Gra Paradiso Range.] *Rivista Geografica Italiana*, Florence, 58(14):277–290, Dec. **1951.** foo refs. In Italian; English summary. **DWB**—Data from 21 stations in the valleys of th Gran Paradiso (highest peak, 4061 m between Mont Blanc and Piedmont) are analyzed an compared with data obtained from recording gages in the higher intervening mountain areas On the north slope about 700 mm and on the south slope 1300 mm fall annually. Monthl variations shown on histograms for 2 slopes. The local influences (slope and elevation) an their effects on rainfall regime are discussed for both slopes. *Subject Headings:* **1. Rainfa**

variations 2. Precipitation distribution 3. Orographic influences 4. Italian Alps 5. Gran Paradiso Range, Italy.—*M.R.*

3.10–233 551.577.3:551.585.3

*Husain, Azra Afzal (Miss)(*Punjab*), **A workable analysis of the precipitation data for Quetta.** *Karachi Geographical Society, Journal*, No. 2:30–40, **1950.** 4 figs., charts, 5 tables. **DLC**—A brief analysis of rainfall, cloud and fog data for Quetta and vicinity in the interior of Baluchistan. Regionally it varies from <4 in. to >20 in. per annum. Rainfall is, in general, scanty, 80% falling in 4 winter months. Summers are extremely dry. Little snow falls, but it is important in the hydrology of the region as it stays on and soaks in the ground during the cool season. Winter precipitation is associated with SE–SW air flow, summer (monsoon) with NE–SE flow. Annual precipitation records for 1880–1940 are plotted showing extreme variability (4 in. to 18 in.), but no cyclical tendency. Heavy rains may occur occasionally at any season. Since cloudiness is slight, not much hope is held out for increasing rain by artificial methods. *Subject Headings:* **1. Rainfall variations 2. Monsoon winds 3. Precipitation frequencies 4. Quetta, Baluchistan.**—*M.R.*

3.10–234 551.577.3:551.579.1(588)

*Shamshad, Khan M., **A note on the rainfall and some means of its conservation in the Zhob, Loralai and Upper Sibi Districts of Baluchistan.** *Karachi Geographical Society, Journal*, No. 2:26–30, **1950.** chart, table. **DLC**—Rain gages are installed in a number of places in Baluchistan, but are not evenly distributed. Hence an accurate estimate of average rainfall over the entire country is impossible. The best records (from 12 stations) up to 1940 are summarized in a table of mean monthly and annual precipitation. The wettest place (Muskahel) has an average of >17 in. a year—the driest <7 in. General cyclonic conditions, effect of orography, stream flow, conservation measures, floods and possible results of artificial rain inducement are discussed briefly. Much wetter and much drier places probably exist in Baluchistan. *Subject Headings:* **1. Rainfall variations 2. Water conservation 3. Baluchistan 4. Pakistan.**—*M.R.*

3.10–235 551.577.37:551.515.1(791)

§Carr, J. A., **The rains over Arizona, August 26–29, 1951.** *Monthly Weather Review*, 79(8):163–167, Aug. **1951.** 9 figs., 2 tables, ref. **DWB**—Confluence of two streams of air having long fetch over warm water areas, one from the Gulf of Mexico and one from the west coast of Mexico and Gulf of California, produced some of the heaviest rains ever recorded in Arizona during August. On the 26th this air, which according to soundings at Phoenix was unusually moist in the *lower* levels (<3 km), produced showers and thunderstorms over southern Arizona and later steady rains and unusually cool weather over most of Arizona, ending a prolonged drought. Surface maps show nothing unusual except absence of usual thermal low. Upper level charts show strong southerly flow over all of the southwest, and into Montana and Idaho. An upper anticyclone over Texas and New Mexico, which built up during a prolonged hot spell, is thought to be responsible for easterly flow of Gulf air across Mexico and southerly flow into Arizona. There upslope motion and convectional heating set off the thunderstorms which cooled the air in the lower levels 20–30°F and provided the convergence necessary for later rains. The cycle ended with the approach of an upper trough over the northwest, bringing air having a fetch over the cold water of the west coast and thus becoming more stable as it entered the relatively hot valleys of the interior southwest. At Phoenix the 5.33 in. in Aug. 1951 was record for 56-year history of station. Payson broke a 43-year record with 10.38 in. *Subject Headings:* **1. Excessive rainfall 2. Rainfall extremes 3. Upper air winds 4. Arizona.**—*M.R.*

3.10–236 551.577.37:551.515.1:551.579.4(781)

§Carr, J. A., **Some aspects of the heavy rains over eastern Kansas, July 10–13, 1951.** *Monthly Weather Review*, 79(7):147–152, July **1951.** 11 figs., 2 tables, 5 refs. **DWB**—Details of circulation at the surface and aloft and other causes of the heavy and prolonged rains that produced floods in Missouri River during July 1951 are given in charts and diagrams and discussed. Heavy rains in Kansas beginning in April were climaxed by the 4 to 5 in. rains on

July 9–10, 5 to 7 ins. on the 11th, and 2 to 5 ins. on the 12th. Thus a total of 9 to 15 ins. fe on an already saturated soil, in 4 days or so. The upper trough over the Plains and ridge ove Gulf of Alaska, with intermittent outbreaks of cold air therefrom, is thought to have bee responsible for abnormal rains in that area. *Subject Headings:* **1. Synoptic studies 2. Ex cessive rainfall 3. Floods 4. Missouri Valley.**—*M.R.*

3.10–237 551.577.3

Illinois. State Water Survey Division, **The storm of July 8, 1951 in North Centra Illinois.** *Illinois. State Water Survey Division, Report of Investigation* No. 14, **1952.** 45 p 38 figs., tables. **DWB**—Detailed case history of a rainstorm with a rainfall exceeding 13 i in some localities. Antecedent conditions and the synoptic situation connected with th storm are described. Three hundred and fifty rainfall observations are tabulated and detailed picture of the rainfall pattern is given on maps and graphs. Radar measurement are discussed. Stage-discharge data are presented in detailed tabular form. Methods an results of a land damage survey are discussed and some effects of the storm shown in photo graphs. It is found that soil conservation practices reduced soil losses by 85.5%. Co tributors to this cooperative study are: WALTER H. ROSCHKE, JR., HARRY W. MAYNARD an G. E. STOUT of Illinois State Water Survey; W. S. DANIELS of U. S. Geological Survey an GEORGE ROBERT HALL of U. S. Soil Conservation Service. *Subject Headings:* **1. Excessiv rainfall 2. Synoptic analysis 3. Illinois. I. Roschke, Walter H., Jr. II. Maynard, Harry W III. Stout, G. E. IV. Daniels, W. S. V. Hall, George Robert.**—*G.T.*

SNOW

(*See also items:* 3.10–29, 3.10–35)

3.10–238 551.578.

Hare, F. Kenneth (*McGill Univ.*), **The present-day snowfall of Labrador-Ungava.** *Amer can Journal of Science*, 249(9):654–670, Sept. **1951.** 8 figs., 10 refs. **DWB**—Isopleth char of mean annual snowfall, number of days per annum with snow, November and March snowfa are presented for Labrador-Ungava peninsula, based on a few older records and a large numb of records from stations established during or since the war (station location chart also pr sented). Mean isobar and wind charts for Feb. 1947 show easterly flow (similar to tha presupposed by ANTEVS for Wisconsin time glacier formation) during a month of apparentl exceptionally heavy snowfall. Closer examination of the snowfall and charts for that mont however, shows that the more northerly part where winds were onshore did not receive heav snow but did have anomalous warmth. Therefore, extreme cold and heavy snowfalls hav not occurred with such a circulation pattern. Most of the snow in this region occurs in front or cyclonic zones, due to southerly flow overriding the surface easterlies. Effect of frozen v open water lakes also considered. *Subject Headings:* **1. Snowfall 2. Glaciation 3. Cyclon activity 4. Frozen lakes 5. Labrador 6. Ungava, Canada.**—*M.R.*

3.10–239 551.578.42(234

*de Quervain, Marcel A. and Zingg, Theodor, **Die aussergewöhnlichen Schneefälle v Januar und Februar 1951 in den Schweizer Alpen und ihre Folgen.** [The unusual snowfall January and February 1951 in the Swiss Alps and its effects.] *Davos, Switzerland. Eidgenö sisches Institut für Schnee- und Lawinenforschung, Mitteilung* No. 8, Dec. **1951.** 15 p. photo tables, graphs, diagrs., refs. Reprint from: *Wasser- und Energiewirtschaft*, Zurich, No. 1 Dec. **1951. DWB**—In connection with largest snowfall on record (since regular daily precip tation recording started in Switzerland in 1864) and the resulting avalanche disasters, th authors, members of the Swiss Institute of Snow and Avalanche Research at Davos, present study of various problems regarding snowfall and avalanche formation. Snowfall data a presented in terms of depth, compression resistance and snow and air temperature. T dramatic events of the most outstanding avalanche catastrophes are related and comment on and several scenes of disasters are pictured. Regional distribution of snowfall and avalanches is shown on charts. A list of damage is presented. Daily average runoff data f various places are graphically represented. Possibilities of forecasting avalanche disast

ıre discussed. *Subject Headings:* **1. Snowfall extremes 2. Snowfall data 3. Avalanches 4. Disasters 5. Swiss Alps.**—*G.T.*

3.10–240 551.578.45:551.524.36(78)

§Carr, J. A., **Snow and record cold in Wyoming and Montana, June 1–3, 1951.** *Monthly Weather Review*, 79(6):129–132, June **1951.** 8 figs., table, 3 refs. **DWB**—Minimum temperatures at many places in Montana, Wyoming and the Black Hills, equalled or exceeded the all-time record for June during a cold outbreak on June 1–3, 1951. The freezing temperatures and snow, which extended as far south as Arizona, are attributed in part to a deep and prolonged flow of northerly winds down the Rockies and in part to the surface cooling by upslope expansion of the air as the flow shifted from N to NE. Surface and upper air charts and temperature soundings made at Rapid City and Great Falls, Montana during the period are reproduced and discussed. At Lander, the 22 inches of snow (and lesser amounts elsewhere) was the greatest and latest snow on record. *Subject Headings:* **1. Cold waves 2. Snowfall extremes 3. Temperature anomalies 4. Snowstorms 5. Montana 6. Wyoming.**—*M.R.*

3.10–241 551.578.46(411)

Champion, Donald L., **Summer snows around Ben Nevis.** *Weather*, 7(6):180–184, June **1952.** 5 figs., 4 photos. **DWB** Observations and photos of snow beds on June 16–17, 1951 at 2350 ft upwards, and daily fluctuations of height of snow line, Sept. 1950–June 1951. Relations to temperature and rainfall discussed. *Subject Heading:* **1. Snow cover.**—*C.E.P.B.*

3.10–242 551.578.46

Glander, W. C., **Snow drifts at Wick.** *Meteorological Magazine*, London, 81(958):120, April **1952.** 2 photos. **DWB**—Describes with photos drifts filling instrument enclosure (fence 3′6″ high) at Wick airport (Caithness, Scotland). *Subject Headings:* **1. Snow cover 2. Caithness, Scotland.**

3.10–243 551.578.46

Manley, Gordon, **John Dalton's snowdrift.** *Weather*, 7(7):210–212, July **1952. DWB**—Popular account of DALTON's observations on summer snowdrifts on Helvellyn, Cumberland, and variations of its persistence. *Subject Heading:* **1. Snow cover.**—*C.E.P.B.*

3.10–244 551.578.46

Scheldrup Paulsen, H., **Det sveitsiske institutt for sne- og lavineforsking.** [The Swiss Institute for Snow and Avalanche Research.] *Naturen*, 76(3):72–79, **1952.** 3 figs. **DWB**—Author stresses the importance of the extensive research work at the Eidgenössisches Institut für Schnee und Lawinenforschung, Weisflujoch (2665 MSL), Davos. During World War I (1914–1918) more soldiers (60,000) of all nationalities lost their lives in the Tyrol because of avalanches than as a result of direct combat. Only an intensive study of the internal state of the snow cover itself can furnish reliable data for predicting avalanches. Such forecasts are broadcast each Friday and 2–3 times a week during heavy snowfall or conditions favoring avalanches. Using artillery to release an avalanche as a preventive measure turned out disastrously in 1951 when the shooting released an avalanche elsewhere that partly buried a village. The planting of forests is an effective method of protection when the snow is dry. Horizontally built and intersecting stone barricades are partially successful, but are expensive to construct and maintain. Hence, they are far surpassed by "fences" made of iron rods of about one m. in length, with fairly large spaces between the rods. *Subject Headings:* **1. Avalanches 2. Avalanche protection 3. Snow cover 4. Davos, Switzerland. Eidgenössiches Institut für Schnee- und Lawinenforschung 5. Swiss Alps.**—*W.N.*

3.10–245 551.578.46:551.578.41

Tushinskiĭ, G. K., **Evoliutsiia snezhnoĭ tolshchiny.** [Evolution of snow thickness.] *Voprosy Geografii, Sbornik*, No. 24, *Fizicheskaia Geografiia*, **1951.** p. 350–379. 10 figs., 5 tables. **DLC**—A comprehensive summary of experimental and field studies on the evolution of snow thickness which brings about the formation of friable horizons within snow giving

rise to avalanches of old dry firn and of snow layers, on means of forecasting snowslides, and o the process of firn formation and the transformation of firn into glacial ice. These studie were carried out at the Khibinsk geographical station of Moscow University and on the Ptys and Alibek glaciers. The following topics are discussed: the factors of firn formation, namel the temperature regime of the snow cover and crystallization, developmental stages in th formation of snow cover; variations in the stratigraphy of snow thickness such as the proces of transition of one type of snow into another and the conditions favoring the formation friable horizons; the evolution of the mechanical properties of snow thickness; the compress bility of snow; determination of the degree of cohesion between different layers of snow; an the classification of snow types. Photographs illustrating various stages in the formation firn are presented. *Subject Headings:* **1. Snow cover research 2. Snow physics 3. Fir formation 4. Avalanches 5. U.S.S.R.**—*I.L.D.*

3.10–246 551.578.7:551.515.4:551.558.

§Byrum, Garland M., **A study of a severe hail storm.** Thesis [M. S.]—New Yor University, May **1951.** 58 p. 26 figs., 3 tables, 35 refs. **DWB**—On May 23, 1950, one the worst hail storms on record occurred at Indianapolis. The storm is described in detai the synoptic, aerological and dynamic conditions analyzed (with many actual and schemat charts and diagrams), and the processes contributing to the development of the storm discusse from a forecaster's point of view. Previous studies of convective activity, especially those b Byers and collaborators of the Thunderstorm Project, are reviewed, and the statement mad that conclusions of the latter with regard to vertical velocities must be revised to take int account such severe conditions as those encountered in this storm. *Subject Headings:* **1. Hai storms 2. Vertical motion 3. Indianapolis, Indiana.**—*M.R.*

3.10–247 551.578.7

Sanson, J., **Un hydrométéore d'aspect particulier.** [A hydrometeor of unusual shape. *La Météorologie*, 4th Ser., No. 24:274, Oct./Dec. **1951. DWB**—Pointed snow pellets wer observed for a quarter of an hour on May 7, 1951 at Odeillo in the Pyrenees at 1800 m altitud A thunderstorm and snow accompanied the fall of "hail." *Subject Headings:* **1. Hail 2. Graup 3. Snow pellets 4. Pyrenees, France.**—*M.R.*

HYDROMETEOROLOGY

(*See also items:* 3.10-5, 3.10-47, 3.10–212, 3.10–214, 3.10–216, 3.10-236, 3.10–266, 3.10–275

3.10–248 551.579

Schiff, Leonard, **Discussion of "Rainfall, infiltration, and hydraulics of flow in runo computation" by H. N. Holtan and M. H. Kirkpatrick, Jr.** *American Geophysical Unio Transactions*, 32(5):780–782, Oct. **1951.** 3 refs., equations. Reply by H. N. Holtan an M. H. Kirkpatrick, Jr. p. 781–782, fig., 2 refs. **DWB**—In reference to the article state in the title, the author develops a series of equations for calculating infiltration and runo Soil-moisture content, land use, detention storage, excess rainfall and rate of surface runo are accounted for. The authors of the article under discussion present an equation for d termining runoff from data on infiltration, depression storage and hydraulics of flow and app it to a storm recorded in Illinois. The original article was published in *AGU. Transaction* 31(5):771–779, Oct. 1950 (*see MAB* 2.6 115, June 1951). *Subject Headings:* **1. Runo I. Holtan, H. N. II. Kirkpatrick, M. H., Jr.**—*G.T.*

3.10–249 551.579.4:627

Schindler, Hans-Georg, **Ursachen und Bekämpfung von Hochwasserkatastrophe** [Causes and prevention of flood catastrophes.] *Umschau*, Frankfurt a.M., 52(4):116–11 Feb. 15, **1952.** 2 figs. **DLC**—After describing effect of sedimentation in causing Po valle floods, author compares results of human activities of floods of Mississippi. Levees are final answer to the problem. *Subject Headings:* **1. Floods 2. Rivers 3. Mississippi Riv 4. Po River.**—*C.E.P.B.*

3.10–250 551.579.4:551.481

Skibniewski, Leonard. **Stanowisko limnologii w stosunku do zagadnien hydrologicznych.** [The position of limnology in relation to hydrological problems.] *Gazeta Obserwatora PIHM*, Warsaw, 4/1:4–6, Jan. 1951. 2 refs., table. DLC—The part played by lakes in the general process of surface and ground water circulation is discussed. Causes of rise and fall of lake levels are analyzed and explained. *Subject Headings:* 1. Limnology 2. Hydrology 3. Water level variations 4. Ground water circulation.—*A.M.P.*

3.10–251 551.579.4(795)

U. S. Forest Service. Division of Flood Control Surveys, **Floods of October 1950 in southern Oregon.** Jan. 10, 1951. 10 p. photos., tables. DWB—Describes meteorological conditions leading up to the floods in southwestern Oregon streams Oct. 28–30, 1950, area affected and damages caused by the floods, conditions of soil and geology and plant cover within the contributing water-sheds, and sediment loads carried by the flood waters. Gives tables of flood crest heights, peak discharges and of contributing storm rainfall; an isohyetal map for the storm period in the affected area, a map of forest types and photographs of watershed conditions. *Subject Headings:* 1. Floods 2. Flood damage 3. Rainfall effects 4. Oregon. I. U. S. Forest Service. Pacific Northwest Forest and Range Experiment Station.—*Author's abstract.*

3.10–252 551.579.4:551.509.5

U. S. Weather Bureau, Cooperative Studies Section, **Maximum possible flood-producing meteorological conditions.** *U. S. Weather Bureau, Cooperative Studies Section, Report* No. 9, June 1949. 24 p. 104 figs., 7 tables, 5 refs. DWB—Data on synoptic elements connected with maximum rain-storms in the Colorado-Little Colorado-San Juan River area during the 31-year period 1899–1929, are analyzed. The study is applied to 6 zones and their combinations. Data on area elevation, seasonal variation of maximum rainstorm, on snowmelt and melting season temperature, maximum possible mid-May general rainstorm, highest and lowest mean daily, 5-, 15-, 30-, 60- and 90-day temperatures, etc. are considered and presented. Tables of maximum depth-duration are added to the isohyetal maps on individual storms. Hydrologic phases of the study were reserved for the Bureau of Reclamation. *Subject Headings:* 1. Flood forecasting 2. Flood protection. I. U. S. Bureau of Reclamation.—*G.T.*

3.10–253 551.579.5

Bosazza, V. L., **Minimum infiltration-rates to underground of rain water in South Africa.** *Nature*, London, 169/4303:674, April 19, 1952. 2 tables, 5 refs. DWB—In dolomites in Transvaal with average rainfall 25–27 in. (mainly summer), 2–10% of rain is recovered from underground. In Okavango delta there is no percolation, entire flow being dissipated by evaporation of 72 in. year. *Subject Headings:* 1. Hydrology 2. Underground water 3. Transmission.—*C.E.P.B.*

3.10–254 551.579.5:551.491

Horst, Hans, **Verfahren zur ungefähren Ermittlung der gewinnbaren Grundwassermengen von Flussgebiete.** [Attempts at approximate estimation of the available ground water of river regions.] *Wasserwirtschaft, Sonderheft*, Stuttgart, p. 27–31, 1952. 7 figs.—A method described for estimating the level of the water table with regard to the lowest natural outlet and the depth of the impervious layer. *Subject Heading:* 1. Underground water.—*C.E.P.B.*

3.10–255 551.579.5(47)

Razumova, L. A., **Izmenenie zapasov pochvennoĭ vlagi v zimniĭ period.** [The change of soil moisture storage during the winter season.] *Meteorologiia i Gidrologiia*, No. 1:35–40, Jan. 1950. 3 refs. DLC—Long period observations show a decrease in soil moisture resources during the summer for the whole U.S.S.R. The increase of this supply begins in late autumn and continues up to spring. On the basis of special determinations of soil moisture the author establishes three types of increase during the winter season: 1. intensive replenishment (regions with a high level of underground waters, especially the northwestern area of European U.S.S.R., average increase of water supply during the winter is 40–50 mm. the maximum is 100 mm or

more), 2) insignificant replenishment (regions with low level of underground waters and co winters, especially in the southeastern area of European U.S.S.R., the increase of soil moistu is 0–15 mm) and 3) transitional type, between first and second one. It is representative regions with low levels of underground waters and the unstable character of the winter seaso *Subject Headings:* **1. Soil moisture 2. Water supply 3. Hydrology 4. U.S.S.R.**—*N.T.Z.*

3.10–256 551.579.5:551.579.2:551.588

Goodell, B. C., **Some observations on fall soil moisture deficits under forest cover a their relation to the winter snow pack.** *Western Snow Conference, Proceedings 1948*, p. 152–15 Feb. 1949. Discussion by H. L. Potts, p. 156. **DWB**—*Subject Headings:* **1. Soil moistu 2. Snow pack 3. Forest influences. I. Potts, H. L.**

3.10–257 551.579.5:634.9:581

Wegener, Kurt, **Los limites climaticos entre la agricultura y el bosque.** [Climatic lim between agriculture and the forest.] *Ciencia e Investigación*, Buenos Aires, 8(2):61–64, Fe **1952. DPU**—Reforestation projects, unless carefully planned, can destroy the agricultu of a country. The roots of cultivated plants are from 3 to 5 m long, those of trees are mu longer. In long periods of drought, such as those experienced in some parts of Argentin cultivated plants will die because the water will be used up by trees with their longer roo After rain has fallen, it may undergo one of the following processes: 1) immediate evaporatio 2) runoff to the sea, 3) evapotranspiration or 4) form ground water. Cultivated plants ne from 600–800 mm of rain annually, forests need at least 1,000 mm. The author conclud that in regions where the rainfall is >1,000 mm/year the planting of trees does not lower t water level and reforestation can be carried out safely, but in areas where the annual rainfall 600–800 mm reforestation is dangerous because the water level would be lowered and t possibility of other planting would be reduced. *Subject Headings:* **1. Forest limits 2. R forestation 3. Argentina.**—*M.L.R.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY OF PARTICULAR PLACES

(*See also items:* 3.10–15, 3.10–30)

3.10–258 551.582:551.585(5

*Ahmad, Kazi Saied-ud-Din (*Pakistan*), **Climatic regions of West Pakistan.** *Pakist Geographical Review*, Lahore, 6(1):1–35, **1951.** plates, tables, refs. **DLC**—In this president address before the section of Geography, Geology and Anthropology at the Third Pakist Science Conference, 1951 at Dacca, the author discusses the various systems of clima classification (Supan, Köppen, Thornthwaite, Blair, Kendrew, Trewartha and Aust Miller) and shows rough charts of West Pakistan with climatic zones drawn in for co parative purposes. Most of Pakistan falls in Köppen's BSH class, where other systems gi widely differing pictures. The author discards all of these systems in favor of a more realis presentation by means of "Tri-Linear Graphs," where the actual data for a 20 year peri are plotted on small graphs for each station and then pasted on the large map of the ar in the proper locations. Then an overlay is prepared with zones demarcated according similarity of these temperature and rainfall regime curves, taking into consideration high and lowest maxima, minima of temperature and rainfall as well as the average values. Regio characteristics, based on knowledge of the locality, also weigh heavily in this demarcation zones (landscapes, topography, precipitation effectiveness, etc.). This classification is bas more on climatic personality than on objective or numerical scales. Thus, factors like aridi winds and human factors can be integrated with temperature and precipitation. The area West Pakistan and Kashmir is divided into >30 major and sub-regions and each is describ separately but in logical sequence. The variation of rainfall within 6 main regions is vivi illustrated by cross section graphs (from one end of the region to the other). An appen gives in outline form the basic factors of the several classification schemes, the outline Pakistan of the author's system, and finally tables of monthly mean maxima and minima a

ainfall at 31 stations. *Subject Headings:* **1. Climate of Pakistan 2. Climatic regions 3. Climatic classifications 4. Pakistan 5. Kashmir.**—*M.R.*

3.10–259 551.582(54)

Bhatty, Maqbool Ahmad (*Univ. of Punjab, Dept. of Geogr.*), **Potwar Plateau (cont'd); limate.** *Pakistan Geographical Review*, Lahore, 4(2):46–55, **1949.** diagr., graph. **DLC**—he climate of Potwar is determined by the summer monsoons and the winter depression. The ear is divided into four seasons: 1) cold weather season Jan.–March; 2) hot weather season April to June; 3) rainy season—July–September; 4) transition from summer to winter monsoon. The characteristics of the several meteorological variables and of special phenomena are escribed. Statistical data are presented in table; distribution of annual rainfall and Jan. and uly circulation are shown on charts. *Subject Headings:* **1. Climate of Potwar 2. Potwar, ndia.**—*I.L.D.*

3.10–260 551.582:551.589.1(691)

§†Duvergé, Pierre, **Principes de météorologie dynamique et types de temps à Madagascar.** Principles of dynamic meteorology and types of weather at Madagascar.] *Madagascar. ervice Météorologique, Publication* No. 13, Jan. **1949.** 134 p. 40 figs., charts, 50 refs. **DWB**—his is a major work on the effect of topography on the climate and synoptic weather conditions n and near Madagascar, and the dynamics of tropical meteorology. The work is full of chematic diagrams and sample synoptic or aerological charts illustrative of types of weather r situations which occur frequently in this region, and which are common to tropical convergence or SE trade wind areas. A good list of references to the important works on the area s appended. The presentation is based on detailed and analytical meteorological climatic lata for a dense network of stations. *Subject Headings:* **1. Tropical meteorology 2. Climate of Madagascar 3. Synoptic analysis 4. Weather types 5. Madagascar. I. Madagascar. ervice Météorologique.**—*M.R.*

3.10–261 551.582(52):581.9

Nuttonson, M. Y., **Ecological crop geography and field practices of Japan. Japan's atural vegetation and agro-climatic analogues in North America.** Washington, D. C., merican Institute of Crop Ecology, **1951.** 213 p. 22 figs., 18 tables, bibl. p. 211–213. **DA**—The most comprehensive of this series of reports based on several months of actual ield work in various parts of Japan. The analogs are, as usual, based on meteorological data or the areas compared, especially mean monthly, seasonal and annual temperature, maximum nd minimum temperatures, precipitation, relative humidity, precipitation effectivity index nd ratio, length of frost free period, latitude, etc. Analogs are computed for all plants as well s spring planted crops, by varying crop-year in computations. In addition to climate, the hysiography soils, forests, land use, farm crops, crop diseases and pests are treated. The eport contains useful data, charts, lists, etc. of native and cultivated species of plants, regions where specified crops are grown, crop rotation systems, meteorological stations, phenological lata, prefectures and districts and characteristics of each individually, etc. *Subject Headings:* **. Climate of Japan 2. Climatic analogs 3. Crop ecology 4. Japan. I. American Institute f Crop Ecology, Wash. D. C.**—*M.R.*

3.10–262 551.582(54)

Riabchikov, A. M., **Klimat.** [Climate.] (In his: **Priroda Indii.** [Geography of ndia.] Moscow, Geografgiz, **1950.** p. 99–156. figs., tables, refs.) **DLC**—A rational and nalytical discussion of the climate, climatic controls and details of the climatic elements of ndia and of various regions of India, with emphasis on the monsoon regime. The basic pproach is that of the synoptic meteorologist as much as that of the conventional geographer. Regionalization follows a classification according to Le Cheminant of 1928 on the basis of noisture conditions, but ample illustrative data are included for various elements (cloudiness, emperature, precipitation, potential evaporation) and for the separate regions. Some descriptive material on floods and flood damage, typhoons and cyclonic damage, etc. is included. *Subject Headings:* **1. Climate of India 2. Monsoons 3. India. I. Le Cheminant, K.**—*M.R.*

CLIMATIC REGIONS

(*See also items:* 3.10–3, 3.10–9)

3.10–263 551.582.1:551.555(6

Jackson, S. P. (*Univ. of Witwatersrand, Johannesburg*), **Climates of Southern Afri** *South African Geographical Journal*, Johannesburg, 33:17–37, Sept. **1951.** 8 figs., 23 re **DWB**—Southern Africa is divided into 8 climatic regions and each one is described wi respect to the general and peculiar meteorological features prevalent there. Charts sh quantitatively the seasonal temperature and rainfall characteristics of representative places each region. The regions are: 1) Mozambique, 2) coastal lowlands of Natal and Cape Provin 3) eastern plateau slopes, 4) eastern plateau of the Union, 5) plateau of Rhodesia, Angola a Nyasaland, 6) semi-arid plateau interior, 7) deserts of South Africa and 8) southwest Ca Province. A new theory of Berg winds is presented in the light of modern synoptic mete ology. The presentation is in general of high caliber. *Subject Headings:* **1. Regional c matology 2. Climatic regions 3. Berg winds 4. South Africa 5. Rhodesia 6. Mozambiq 7. Angola.**—*M.R.*

3.10–264 551.582.1:551.577.2(7

Kerr, D. P. (*Toronto Univ., Dept. Geogr.*), **The summer-dry climate of Georgia Basi British Columbia.** *Royal Canadian Institute, Transactions*, 29(1):23–31, **1951.** 6 figs., 5 re **DLC**—The Georgia Basin lies between the low mountain ranges of Vancouver Island, t higher Olympic mountains of N.W. Washington State, and the solid wall of the Casca mountains of British Columbia and Washington. The climate is exceedingly dry during t summer, because the prevailing northwesterlies blow over upwelling cold water off the co and occasional disturbances lose their moisture on the westerly slopes of the coast rang Saanich peninsula (near Victoria, Vancouver Island) is the farthest north (48°) example o cool Mediterranean climate (KÖPPEN) and has an acute water deficiency (10 in.) in Ju August and early September. This is reflected in vegetation, forest types and soils. *Subj Headings:* **1. Climatic regions 2. Precipitation deficiency 3. Georgia Basin, British Columb 4. Victoria, B. C.**—*M.R.*

CLIMATIC CHANGES

(*See also items:* 3.10–14, 3.10–178)

3.10–265 551.583(431)(0

Thom, Reinhard, **Landschafts- und Kulturwandel seit der letzten Vereisung im nor deutschen Flachlande, vornehmlich zwischen Elbe und Oder.** [Landscape and cultu change since the last glaciation in the north German plain, especially between Elbe and Oder *Erde*, Berlin, 2(3–4):246–257, **1951.** 2 figs., fold. plate, table, 10 refs. **DLC**—Author brin together the manifold relations of climate, plant life, geography and prehistory since 20,0 B. C. These are summarized in a large folding plate; there is also a curve of mean July te perature. *Subject Headings:* **1. Climatic changes 2. History of climatology 3. Germany.** *C.E.P.B.*

3.10–266 551.583.14:551.579:551.58

Markov, K. K., **Vysykhaet li Sredniaia i Tsentral'naia Azia?** [Are middle and Cent Asia drying up?] *Voprosy Geografii, Sbornik*, No. 24, *Fizicheskaia Geografiia*, **1951.** p. 9 116. **DLC**—The author summarizes recent Soviet studies confirming L. S. BERG's opini that Central and Middle Asia have not experienced any decrease in moisture during histo times, and that increase in area of steppe is a consequence of socio-economical conditions whi led to decreased agricultural activity. These investigations, based upon pollen analysis a upon levels of lakes, indicate a cyclical trend in decrease of moisture but not an absolute c crease. On the other hand, Central and Middle Asia were subjected to considerable desiccati and cooling from the upper cretaceous to the glacial periods with a consequent extension of t steppe area. *Subject Headings:* **1. Climatic changes 2. Land utilization 3. Pollen analys 4. Desiccation 5. Steppe climates 6. Asia.**—*I.L.D.*

3.10–267 551.583.15:551.509.39:551.524.36

U. S. Quartermaster Corps, **Evaluation of climatic extremes.** *U. S. Quartermaster Corps. Environmental Protection Section, Report* No. 175, March **1951.** 29 p.+12 p. of forms. tables, 8 refs., equations. **DWB**—The statistical theory of extreme values is applied to estimating the probability of occurrence of extreme values of various climatic elements, in particular atmospheric temperature at Death Valley. The basic theory is developed and illustrative examples are given and worked out. *Subject Headings:* **1. Climatic extremes 2. Statistics in climatology 3. Extreme temperatures 4. Death Valley, Calif.**—*I.L.D.*

3.10–268 551.583.2(51)

Andersson, J. G., **Olösta gåtor.** [Unsolved riddles.] *Svensk Geografisk Årsbok*, Lund, 25:34–82, **1949.** photos., diagrs., refs. In Swedish, English summary p. 79–82. **DLC**—In this long article on archaeological and anthropological discoveries made by the author in Spitzbergen and North China (near Peking and Tientsin), there is a chapter on postglacial climatic changes (p. 69–79) wherein the author claims that the climate of North China was warmer and more rainy about 4000 B. C. than at present. Evidence cited includes remains of elephants, rhinoceros, peat bogs of a type now present only in the Yangtze Valley, sand deposits, loess, lake beds, flood and oceanic inundation traces, etc. Remains of rare water birds are found in the driest part of the Gobi Desert. No signs of glaciation appear in North China, but alternation of gravel and loess indicate alternate dry and wet periods. *Subject Headings:* **1. Climatic changes 2. Postglacial climates 3. North China.**—*M.R.*

3.10–269 551.583.3:551.4(66)

Büdel, Julius, **Bericht über klima-morphologische und Eiszeit-Forschungen in Nieder-Afrika auf Grund einer Forschungsreise 1950/51. Beiträge zur Geomorphologie der Klimazonen und Vorzeitklima VIII.** [Report on climatic-morphological and Ice Age investigations in northern Africa based on an expedition 1950/51. Contributions to the geomorphology of climatic zones and prehistoric climate VIII.] *Erdkunde*, Bonn, 6(2–3):104–132, June **1952.** 3 figs., 6 photos., 43 refs. **DLC**—A reconstruction of the climatic history of the Sahara and moist zones to north and south during and since late Ice Age is based mainly on fossil, historical and present landscapes. In the Tell Atlas the Würm snow line was unusually low (1900 m) and shows a cold, wet period. In the winter rain region of the Sahara Atlas and northern desert, river deposits and limestone crusts indicate 4 Pleistocene-Recent dry periods with intervening rainy periods. The true desert was largely replaced by steppe, with stream erosion exceeding wind erosion. The Sahara was narrowed during Ice Age but in the southern dry savannah the rainy period was followed by a severe post-glacial dry period. In the moist savannah near the equator there are no traces of climatic change. N–S cross sections compare bioclimatic height zones of last pluvial period with the present. *Subject Headings:* **1. Quaternary climates 2. Morphology 3. North Africa.**—*C.E.P.B.*

3.10–270 551.583.3:551.577.38

Grichuk, V. P., **O zasushlivom periode v poslelednikovoe vremia na territorii evropeiskoĭ chasti SSSR.** [The drought period during postglacial time in European past in the USSR.] *Voprosy Geografii, Sbornik*, No. 24, *Fizicheskaia Geografiia*, **1951.** p. 165–191. 6 figs., 4 tables, refs. **DLC**—A detailed presentation of the evidence, provided by pollen analysis of peat deposits in the vicinity of Leningrad, that steppe vegetation existed between Moscow and Leningrad after the Valdai glacial period indicating a warm dry climate considerably to the north of the present steppe zone. Traces of steppe vegetation have been found in the lower horizons of postglacial deposits, belonging to the arctic period, but they diminish in the subsequent subarctic period. No indications of steppe vegetation can be found in the boreal and subboreal periods in the Moscow area. *Subject Headings:* **1. Paleoclimatology 2. Postglacial drought period 3. Pollen analysis 4. U.S.S.R.**—*I.L.D.*

3.10–271 551.583.3:551.524.4

Mortensen, Hans, **Heutiger Firnrückgang und Eiszeitklima.** [Present-day firn retreat and Ice Age climate.] *Erdkunde*, Bonn, 6(2–3):145–160, June **1952.** 7 figs., 37 refs. **DLC**—The catastrophic retreat of glaciers and upper firn in Central Alps in last 100 years is attributed

to increased ablation due to higher temperatures; snowfall has even increased. The cause of Ice Age glaciation is discussed on similar lines. The lowering of temperature was then about 5°C (even zero above present snow line) compared with 10–15° in lowlands of Germany in summer and 7–8° in annual mean. This is explained by assuming nearly isothermal or even inversion conditions in Alps during glaciation, up to 2–3 km, above which temperature resembled present. Similar conditions existed in Andes. It is possible that world temperature did not differ from present and that glaciation was due to more frequent inbreaks of shallow polar air masses. *Subject Headings:* **1. Glacial periods 2. Temperature inversions.**—*C.E.P.B.*

MICROCLIMATOLOGY

(*See also item:* 3.10–185)

3.10–272 551.584:631.6:551.525.2

Sato, S., **Microclimatic studies on some methods of irrigation in the rice-field. (3rd report).** *Journal of Agricultural Meteorology*, Tokyo, 6(3/4):179–181, Aug. **1951.** fig., 3 tables, 8 equations. In Japanese, English summary p. 181. **DWB**—Daily changes in water and soil temperature at various depths (1 cm to 3 cm) in a rice field with stagnant water and in one with running water, and the thermal diffusivity (a^2) are shown in tables and by means of graphs and formulas. The soil temperature can thus be controlled by controlling the amount of water used in irrigation. *Subject Headings:* **1. Irrigation effects 2. Soil temperatures 3. Rice.**—*M.R.*

3.10–273 551.584.2:551.524.3

Bylund, Erik and Sundborg, Åke, **Lokalklimatets inverkan på babyggelsens läge i Arvidsjaurs socken.** [Local climatic influences on the location of settlements in the rural district of Arvidsjaur.] *Ymer*, Stockholm, 1:1–30, **1952.** 12 figs., 19 refs. English summary p. 29–30. **DLC**—A microclimatic and statistical study based on data obtained with thermographs and minimum temperature in the autumn of 1950 in the vicinity of old town (1750–1820) in Northern Sweden (Lappland): 65°–66°N. It is shown that the towns were located high on slopes rather than in frost pockets because of the milder temperatures during later summer as affecting crops. Long narrow tongues of land extending into lakes are the most favored locations for settlements (with respect to autumn frost). Differences of 8°–9°C were found between low and high lying stations only 2–3 km and 80–90 m in height from each other. Experience on first settlement in the low lying and protected bog areas must have influenced residents in moving to areas where frequency of low temperatures is much lower. Profiles show relation of temperature to relief. Frequencies of minimum temperature are shown graphically. *Subject Headings:* **1. Local climatology 2. Frost pockets 3. Minimum temperatures 4. Arvidsjaus, Sweden.**—*M.R.*

3.10–274 551.584.4:551.586:633.1

*Tsuboi, Y. and Izumi, S., **Characteristics of meteorological environment in field of rice planted directly between wheat rows.** *Journal of Agricultural Meteorology*, Tokyo, 6(3.4):185–187, Aug. **1951.** 3 figs., 5 tables. In Japanese, English summary p. 187. **DWB**—Based on micrometeorological measurements in a field of alternate wheat rows and on bare soil in 1947 and 1948. Sunshine between wheat rows was reduced 20–40% in morning and evening, so soil temperature was lower than in the bare field during the whole day, but higher at night. Soil moisture between wheat rows 30% higher and evaporation only 60% of that in bare field. Graphs show comparative values for 24 hour period. *Subject Headings:* **1. Micrometeorological data 2. Soil temperatures 3. Vegetative influences 4. Grain crops.**—*M.R.*

BIOCLIMATOLOGY

(*See also item:* 3.10–274)

3.10–275 551.586:631.6:551.579.5

Fukutomi, T., **On the water requirement of rice plants.** *Journal of Agricultural Meteorology*, Tokyo, 6(3/4):143–146, Aug. **1951.** 2 figs., 3 tables, 10 refs. In Japanese. **DWB**—*Subject Headings:* **1. Agricultural meteorology 2. Soil moisture requirements 3. Rice.**

3.10–276 551.586:632

Tazawa, H., **Agro-meteorological studies on rice culture in the cold region.** (I). *Journal of Agricultural Meteorology*, Tokyo, 6(3/4):115–118, Aug. 1951. 3 figs., table, 3 refs. In Japanese. **DWB**—*Subject Headings:* **1. Agricultural meteorology 2. Rice.**

3.10–277 551.586:632.1:551.515.2

Matsuo, T., Tsuboi, Y. and Tsunoda, S., **Occurrence of withered and completely sterile ears in rice plants by attack of typhoon, with special reference to varietal resistance.** (1). *Journal of Agricultural Meteorology*, Tokyo, 6(3/4):107–110, Aug. 1951. fig., 6 tables. In Japanese. **DWB**—*Subject Headings:* **1. Agricultural meteorology 2. Plant resistance 3. Rice 4. Typhoon damage.**

3.10–278 551.586:632.1:551.556.1

Kimura, I., **On the dry wind damage (white head) in rice plants (2nd Report).** *Journal of Agricultural Meteorology*, Tokyo, 6(3/4):111–114, Aug. 1951. fig., 4 tables. In Japanese. **DWB**—*Subject Headings:* **1. Agricultural meteorology 2. Wind damage 3. Rice.**

MISCELLANEOUS APPLICATIONS

3.10–279 551.590.21(02)

Menzel, Donald H., **Our sun.** Philadelphia, Blakiston, 1950. 326 p. 178 figs., 6 tables, refs. **DWB**—A beautifully illustrated and handy textbook or reference work based on years of research and survey literature in respect to the physical-chemical conditions of the sun and their effects on terrestrial atmospheric, magnetic and other geophysical phenomena. The results of basic research done during the war (1939–1945) have, fortunately, been included. Discussions of interest to meteorologists include among others, those on auroras, the production of ozone by UV radiation, long range forecasting based on solar influences, the sun's corona, cycles, climatic changes, solar heating, effect of eclipses, magnetic storms, sunspots, solar faculae, solar spectroscopy, radio communication, ionospheric physics and last and definitely least, the poorly established relations between the sunspot cycle and human behavior (economic and biological factors) which the author maintains should be viewed with suspicion. *Subject Headings:* **1. Solar influences 2. Solar physics 3. Textbooks.**—*M.R.*

PART II. ANNOTATED BIBLIOGRAPHY ON GLAZE AND RIME AT THE EARTH'S SURFACE

By: *Nikolay T. Zikeev*

EXPLANATORY NOTE

This bibliography contains works dealing with the characteristics of the processes of ice deposi tions near the ground and the physical properties of hydrometeors. Many items on glaze and rim in the upper atmosphere can be found in the bibliography on "Icing" by HARRIS P. KRAMER, in Me teorological Abstracts and Bibliography in Sept. 1950 (*see item* 3J–214 below). Special attention ha been paid to the problem of terminology, since confusion in the use of terms very often occurs. Fo example, glaze may be called glazed frost, ice, sleet, etc. The word "rime" is sometimes applied t hoar frost and instead of hoar frost the term frost is often used. Consequently, it is hard to unde stand which phenomenon is meant—a hydrometeor (hoar frost) or just the temperature belo the freezing point. The classification of hydrometeors adopted by the International Meteorologica Organization was used exclusively in the text and for the subject headings. The term "ice deposit has been used for those cases when it was difficult to determine the actual type of hydrometeo described by the author, or when the general processes were investigated without any particula specification. Almost all works on the subject which were available are included in this bibl ography. Textbooks as a rule are not included. The systematic observational data on glaze, rim and hoar frost, not included in this bibliography, can be found in the official climatological an meteorological records of the United States, U.S.S.R., Great Britain, Germany and other countrie

The material in this bibliography is arranged chronologically. If the reader wishes to fin material on any particular phase of this broad subject he should refer to the subject outline whic follows. A systematic geographical outline is also included.

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BIBLIOGRAPHY ON GLAZE AND RIME

1833

3J–1 551.574.42:551.524

Herschel, Sir John, **Notice of a remarkable disposition of ice round the decaying stems of vegetables, during frost.** *London, Edinburgh and Dublin Philosophical Magazine and Journal of Science, New Ser.*, 2(8):110–111, Feb. **1833.** 3 figs. (in append.). **DWB**—Report on observations of ice crystal formation on various plants, with characteristics of temperature conditions. *Subject Headings:* **1. Ice crystal formation 2. Temperature effects.**

1864

3J–2 551.574.42

Mohr, K., **Eisregen und Rauhfrost.** [Glaze and rime.] *Annalen der Physik und Chemie*, Leipzig, 121(4):637–646, April 15, **1864.** 3 tables. **DLC**—The author describes weather conditions (pressure, air temperature, relative humidity) which accompanied several cases of glaze and rime formation and draws some conclusions on the nature of ice deposits. *Subject Headings:* **1. Glaze storms 2. Rime formation.**

1867

3J–3 551.574.42

Wilhelm, G., **Über die Wassermenge, welche der Boden durch starken Duft (Rauhreif) empfängt.** [On the amount of water the soil receives from rime.] *Meteorologische Zeitschrift*, 2(5):125–126, March 1, **1867. DWB**—China plates were used to measure the intensity of ice deposits at a height of 3–6 inches above surface. *Subject Heading:* **1. Rime measurement techniques.**

1879

3J–4 551.574.42:551.543:551.524(44)

de Tastes, ——, **Sur le verglas du 22 janvier.** [On the glaze storm of January 22.] *Académie des Sciences, Paris, Comptes Rendus*, 88(25):1119–1201, June 9, **1879.** map, ref. **DLC**—A comprehensive description of a case of intensive glaze formation observed on Jan. 22, 1879 and pressure and temperature conditions during this formation. A map shows regions in France covered by ice and by glaze, respectively. *Subject Headings:* **1. Glaze storms 2. Glaze intensity 3. Temperature effects 4. France**

3J–5 551.574.42(44)

Jamin, J., **Le verglas du 23 janvier.** [Glaze storm of January 23.] *Revue des Deux Mondes*, Paris, 31:922–934, Feb. 15, **1879. DLC**—Description of a case of severe glaze which occurred in France in Jan. 1879 when the branches of some 50% of the trees were broken. *Subject Headings:* **1. Glaze damage 2. Glaze intensity 3. Glaze storms 4. France.**

1882

3J–6 551.574.42(76)

Nipher, Francis E., **Sleet-storm of February 19–20, 1882.** *Academy of Science of St. Louis, Proceedings*, 4:72–73, March 6, **1882. DLC**—Frozen rain which fell in northern part of Missouri caused much damage to communication lines and trees. This glazed frost was observed to be up to 1 in. thick. *Subject Headings:* **1. Glaze intensity 2. Icing of communication wires 3. Glaze storms 4. Missouri.**

1886

3J–7 551.574.41 551.574.42

P——, F. H., **Dew.** *Nature*, London, 33(848):293–294, Jan. 28, **1886.** ref. **DLC**—Observations of conditions of hoar frost and dew formation on different objects (grass, wooden rails, twigs, etc.). (*Same item* as 3D–32, April 1952, *MAB.*) *Subject Headings:* **1. Hoar frost formation 2. Dew formation.**

3J–8 551.574.42:551.524:551.55(77)

Pike, F. V., **Three "ice-storms."** *American Meteorological Journal*, 3(1):32–39, May **1886. DLC**—A detailed description of three cases of glaze observed during late winter in the northern part of the United States and temperature and wind conditions before and during the storms. The intensive glaze deposit (the weight of a little twig with ice was multiplied up to 496 times its weight when free of ice) caused much damage to communication lines and trees. *Subject Headings:* **1. Glaze storms 2. Glaze intensity 3. Glaze damage 4. Temperature effects 5. Wind effects 6. United States.**

1887

3J–9 551.574.42

Shenrok, A., **K voprosu ob opredelenii izmorozi i gololeditsy.** [On the problem of definition of rime and glaze.] *Akademiia Nauk, SSSR, Meteorologischeskii Sbornik,* 11(2):36–42, **1887. DLC**—A short review of conditions conducive to the formation of dew, hoar frost, rime and glaze. Definitions, which were made by many scientists, concerning the nature and terms of rime and glaze are discussed and some conclusions on this problem reached. *Subject Headings:* **1. Glaze 2. Rime 3. Hoar frost 4. Definitions.**

1888

3J–10 551.574.42(43)

Frankenhagen, F., **Niederschläge in der Form von durchsichtigen kleinen Eiskugeln.** [Precipitation in the form of transparent ice pellets.] *Meteorologische Zeitschrift,* 23(6):241–244, June **1888.** 2 refs. **DLC**—Report on observations of this phenomenon at Stettin on March 19, 1888, and accompanying weather conditions. The author reviews briefly similar phenomena which were observed in other parts of Germany. *Subject Headings:* **1. Ice pellets 2. Stettin, Germany.**

3J–11 551.574.42

Reiman, —, **Wirkungen des Rauhfrostes.** [Influence of rime.] *Meteorologische Zeitschrift,* 23(1):25, Jan. **1888. DLC**—Remarks on rime damage to wires. *Subject Headings:* **1. Rime damage 2. Icing of wires.**

1889

3J–12 551.574.42

Plowright, C. B., **Oak tree broken by rime, January, 1889.** *Gardeners' Chronicle,* London, 3rd Ser., 5(120):459–460, April 13, **1889.** fig. **DLC**—Report on great damage to trees by rime. The crystals of rime on Jan. 7 were not less than 1.5 inches long. Similar damage was also observed 12–13 years previously. *Subject Headings:* **1. Rime intensity 2. Rime damage 3. Forests 4. King's Lynn, England.**

1892

3J–13 551.574.42:551.524(436)

Breitenlohner, —, **Der Eisregen am 23. Januar 1892 in Wien.** [Glaze storm on January 23, 1892 in Vienna.] *Meteorologische Zeitschrift,* 27(4):159–160, April **1892. DLC**—This case was observed during supercooled rain, when air temperature rose from −11.3°C to +3.2°C. The density of ice reached 0.61, average density was 0.50. *Subject Headings:* **1. Glaze storms 2. Glaze density 3. Temperature effects 4. Vienna, Austria.**

1893

3J–14 551.574.42(51)

Frost und Eisregen in Hongkong. [Frost and glaze in Hong Kong.] *Meteorologische Zeitschrift,* 28(5):180, May **1893.** 2 refs. **DLC**—Unusual fall of air temperature was noticed on Jan. 17–18, 1893 in Hong Kong-Canton region. At Victoria Peak (550 m above sea level) minimum was −4°C, and in Canton −3.9°C. The glazed ice formed from supercooled rain caused much damage to vegetation, wires, etc. Maximum thickness of this glaze was $\frac{5}{8}$ in. *Subject Headings:* **1. Glaze storms 2. Glaze intensity 3. Glaze damage 4. Temperature effects 5. Hong Kong 6. Canton, China.**

1894

3J–15 551.574.42(79)

Edson, Helen R., **Frost-forms on Roan Mountain.** *Popular Science Monthly,* 45(1):30–39, May **1894.** 13 photos. **DLC**—A description of various forms of solid deposit on wooden pillar, rough board, blade of grass and other objects observed during winter 1892–1893 on Roan Mountain (6313 ft). Size, shape and location of the deposit depended on amount of moisture, temperature, wind direction, etc. *Subject Headings:* **1. Frost deposits 2. Roan Mountain, North Carolina.**

3J–16 551.574.42:551.524:551.55(498)

*Hepites, Stefan C., **Le verglas du 11 et du 12 novembre 1893.** [Glaze storm of November 11–12, 1893.] *Romania. Institutul Meteorologic, Analele,* 7(2):119–126, **1891**; issued in **1894.** 4 figs. **DWB**—A description of weather conditions and intensity of glaze for numerous points in Romania. These intensive formations were observed when air temperature was near the freezing point and northeasterly winds blew with a velocity of about 14 m/sec. *Subject Headings:* **1. Glaze storms 2. Glaze intensity 3. Temperature effects 4. Wind effects 5. Romania.**

3J–17 551.574.41 551.574.42

Voeĭkov, Aleksandr Ivanovich, **Rosa i ineĭ.** [Dew and hoar frost.] *Meteorologicheskiĭ Vestnik*, Leningrad, 4(9):337–344, Sept. **1894.** 8 refs. **DWB**—A study on the formation of dew and hoar frost. The author analyzes weather conditions conducive to this formation, presents a brief review of the work done by others and concludes that forests increase the amount of dew and hoar frost deposits. *Subject Headings:* **1. Hoar frost formation 2. Dew formation 3. Forest influences.**

1895

3J–18 551.574.42:551.55(43)

Fischer, W. R., **Protection against rime.** (In: Schlich, William, **Manual of forestry.** v. 4, chap. 7:493–495. London, **1895.** 3 figs., ref.) **DLC**—In the Harz Mountains during 1827–1875 numerous cases of glaze were observed. The weight of the formation of ice on the trees was often fifty pounds on six pounds of wood. Most of the damage occurred in January and February during northerly and northeasterly winds. *Subject Headings:* **1. Glaze damage 2. Wind effects 3. Harz Mountains, Germany. I. Schlich, William.**

1898

3J–19 551.574.42:551.524.3:551.553(43)

Meinardus, Wilhelm, **Der Eisregenfall vom 20. October 1898 über Mittel- und Ostdeutschland.** [Ice storm on Oct. 20, 1898 over middle and eastern Germany.] *Das Wetter*, 15(11):247–260, Nov. **1898.** 2 maps, fig., table, 10 refs. **DWB.** Also in: *Meteorologische Zeitschrift*, 34(4):165–171, April **1899. DLC**—Description of a case of severe glaze. Author analyzes weather conditions near the surface and in upper atmosphere with details of temperature and wind variations. *Subject Headings:* **1. Glaze storms 2. Temperature effects 3. Wind effects 4. Germany.**

1899

3J–20 551.574.42(43):621.39

Beschädigung der Telegraphen- und Fernsprechanlagen im Kreise Waldenberg (Schlesien) durch Eisbelastung und Baumbruch. [Damage to telegraph and telephone installations in the Waldenberg district (Silesia) by ice accumulation and breakage of poles.] *Archiv für Post und Telegraphie*, Berlin, No. 1, **1899.** Summary in: *Meteorologische Zeitschrift*, 34(4):171–173, April **1899. DLC**—Description of heavy damage caused by an ice storm on the night of October 19–20, 1898 in central and eastern Germany. *Subject Headings:* **1. Glaze storms 2. Glaze damage 3. Icing of communication wires 4. Germany.**

1900

3J–21 551.574.42(00)

Abbe, Cleveland, **Frost work in South Africa.** *Monthly Weather Review*, 28(1):14, Jan. **1900. DLC**—Description of ice phenomenon observed at Qachas Nek in Basutoland on August 6, 1898 at an elevation of 7,150 ft. Most probably a deposit from fog or mist. *Subject Headings:* **1. Frost deposits 2. Basutoland, South Africa.**

3J–22 551.574.42:551.55:634

Schrenk, Hermann von, **A severe sleet storm.** *Academy of Science of St. Louis, Transactions*, 10(5):143–150, April 12, **1900.** 4 figs., table, 9 refs. Review by Cleveland Abbe in: *Monthly Weather Review*, 28(3):113–114, **1900. DLC**—Description of several glaze storms and damage in the United States and Europe. The author analyzes the cause of this damage and finds that wind is an important factor in glaze damage to trees. *Subject Headings:* **1. Glaze storms 2. Glaze damage 3. Wind effects 4. Europe 5. North Central States. I. Abbe, Cleveland.**

1902

3J–23 551.574.42(73)

Glatteisbildungen im Innern der Vereinigten Staaten. [Glaze formation in the central U.S.A.] *Meteorologische Zeitschrift*, 37(2):88–89, Feb. **1902. DLC**—Review of report by HERMANN VON SCHRENK on sleet storm of Feb. 27, 1900 in Missouri, Illinois, Indiana and Ohio, and that by FRANCIS E. NIPHER on 400 lbs of ice which formed on Feb. 9 and 20, 1882 on a 10 ft cedar tree in the same region. Weather conditions and damage to trees are cited in some detail (*see item* 3J–22 above). *Subject Headings:* **1. Glaze storms 2. Glaze intensity 3. North Central States. I. Schrenk, Hermann von II. Nipher, Francis E.**—*M.R.*

3J–24 551.574.41 551.574.4

Nicolas, Ad., **Le givre et la rosée.** [Hoar frost and dew.] *Société d'Agriculture, Sciences Arts d'Angers, Mémoires*, Ser. 5, 5:166–174, **1902.**—This paper consists of generalities on the histor of the study of dew and hoar frost, the seasonal distribution of atmospheric humidity over the eart and its relation to formation of frost, dew, cirrus clouds, rain and snow. The relationship betwee cloudiness, wind, rain and subsequent dew or frost formation is also considered. *Subject Heading* **1. Hoar frost 2. Dew.**—*M.R.*

3J–25 551.574.42(4

*Passerat, C., **Essai d'une carte de la répartition des jours de gelée en France.** [Attempt map distribution of days with hoar frost in France.] *Annales de Géographie*, Paris, 11(56):111–11 March 15, **1902.** chart, 21 refs. **DLC**—Comprehensive study of hoar frost frequency in Franc based on long period observations. The author analyzes the relation of hoar frost formation altitude and other geographical factors, urban and rural position of observation point, etc. Th mean number of days over France, as shown on large colored chart, varied from less than 20 cas per year up to 100 cases and more. *Subject Headings:* **1. Hoar frost frequency 2. Long perio records 3. France.**

1903

3J–26 551.574.42(9

Dobrowolski, Antoni Boleslav, **La neige et le givre.** [Snow and rime.] (In: Belgium. Cor mission de la "Belgica," Expédition Antarctique Belge, **Résultats du voyage de S. Y. Belgica e 1897–1898–1899. Rapports Scientifiques, v. 3/4, Météorologie.** Pt. 3. Anvers, **1903.** 78 p. figs., refs.) **DWB**—In Pt. 2, p. 61–78, entitled "Quelques observations sur le givre" (Some observ tions on rime) the author describes conditions of rime formation on vertical and horizontal objec and studies the problem of rime structure in detail. The crystalline forms of rime were observe more frequently than the amorphous forms. *Subject Headings:* **1. Rime formation 2. Rime structu 3. Antarctica.**

3J–27 551.574.4 551.5

Vel'bel, B. M., **K voprosu o soderzhanii azota v atmospfernykh osadrakh.** [On the problem nitrogen content in precipitation.] *Zhurnal Opytnoĭ Agronomii*, St. Petersburg, 4(2):188–19 **1903.** 3 tables. German summary p. 194–195. **DLC**—Report on investigations made at th Agricultural Experimental Station in Ploti (Kamenets-Podol'sk province) during 1900–190 Summary gives following results of NH_3 content in different forms of precipitation (mg/l): in sno 0.915; in rain, 0.964; in rime, 2.700; in hoar frost, 4.200; in dew, 5.000 and in fog, 5.570. Mea content in precipitation of all forms: NH_3—1.056 mg; NHO_2—0.035; NHO_3—0.193. *Subje Headings:* **1. Precipitation analysis 2. Nitrogen content of rime.**

3J–28 551.574.

Gelée blanche, givre, verglas. [Hoar frost, glaze, rime.] *Société Belge d'Astronomie, Météorologie et de Physique du Globe, Bulletin Climatologique*, Brussels, 2(3):25–26, March 190 **DLC**—A description of conditions under which glaze, rime and hoar frost form. *Subject Headin* **1. Glaze formation 2. Rime formation 3. Hoar frost formation.**

1905

3J–29 551.574.42(4

Guillaume, Ch. Ed., **Remarquable dépôt de givre.** [Remarkable deposit of rime.] *La Natu* Paris, 33(1651):98, Jan. 14, **1905.** fig. **DWB**—A description of conditions of rime formatio observed in Versailles on Nov. 27, 1904 during freezing and humid weather. The thickness of ri reached 12–15 mm, and rime was formed on the windward side of objects. *Subject Headin* **1. Rime formation 2. Rime intensity 3. Versailles, France.**

3J–30 551.574.42(47

Johansson, Oskar V., **Zur Definition des Rauhfrostes und Glatteises.** [On definition of rime a glaze.] *Meteorologische Zeitschrift*, 40(1):27–29, Jan. **1905.** 3 refs. **DLC**—Describes conditio necessary for hoar frost, rime and glaze formation in Helsinki. *Subject Headings:* **1. Glaze formati 2. Rime 3. Hoar frost 4. Helsinki, Finland.**

3J–31 551.574.42(42

Warner, H. M., **A feather-like form of frost.** *Nature*, London, 72(1856):80, May 25, 19 fig. **DLC**—Description of a solid deposit which was observed at Carnedd Llewelyn, N. Wales (34 ft), on the windward side. *Subject Headings:* **1. Frost deposits 2. Carnedd Llewelyn, Wales.**

1906

3J–32 551.574.42

Clayton, Henry Helm. **The international symbols.** *Monthly Weather Review*, 34(8):357, Aug. 906. refs. **DLC**—A note on mistaken use of the term "silver thaw." The Vienna Congress in 374 established that "silver thaw" is equivalent to the German "Rauhfrost" (symbol V—rime) and ie term glazed ice "Glatteis" (symbol ∞) equivalent to the American "ice storm." *Subject Head-gs:* **1. Glaze 2. Silver thaw 3. Terminology.**

3J–33 551.574.42:551.524:551.55

Kleinschmidt, Ernst, Sr., **Der Eisregenfall am 19. November 1905.** [Glazed ice on November), 1905.] *Meteorologische Zeitschrift*, 23(5):216–220, May **1906.** 3 tables, 4 refs. **DWB**—A escription of a case of glaze in Alsace-Lorraine with detailed analysis of temperature and wind onditions before and during its formation. The author makes some theoretical remarks on the ature of this phenomenon. *Subject Headings:* **1. Glaze storms 2. Glaze formation 3. Temperature ffects 4. Wind effects 5. Alsace-Lorraine, France.**

3J–34 551.311.1

Leduc, A., **Sur la densité de la glace.** [On ice density.] *Académie des Sciences, Paris, Comptes endus*, 142:149–151, Jan. 15, **1906. DLC**—The density of ice at a temperature of 0°C was deter-ined as 0.9176. The content of gas in ice was established as 1 cm^3/l. *Subject Headings:* **1. Ice ensity 2. Ice composition.**

1907

3J–35 551.574.42

Gunther, R. T., **A frost thistle: a beautiful effect of freezing.** *Nature*, London, 98(2463):370, n. 11, **1907.** fig. **DLC**—Description of beautiful forms assumed by chains of air bubbles which parate from water in a bottle when it is allowed to freeze (not too slowly). *Subject Heading:* **Ice deposit formations.**

3J–36 551.574.42(494.1)

Hoar frost at high altitudes. *Geographical Journal*, London, 29(1):95, Jan. **1907. DLC**—A view of the 14th annual report from Hohen Sonnblick Observatory on hoar frost observation. On e Sonnblick (10,180 ft) there were 36 days in 1903, 50 days in 1904 and 39 days in 1905 when hoar ost formed. At the "Regina Margheritta" Observatory (15,160 ft) on Monte Rosa (the highest eteorological observatory in Europe), hoar frost formation also appears to be of frequent occurrence cording to the statements of Prof. Alessandri. *Subject Headings:* **1. Hoar frost observation Mountain meteorology 3. Alps.**

1908

3J–37 551.574.42(47)

Vangengeim, F. P., **Gololeditsa (ozheled') 14/27 fevralia 1908 goda.** [Glazed frost, February 1/27, 1908.] *Meteorologicheskiĭ Vestnik*, 18(3):120, March **1908. DWB**—Description of one case severe glaze. The formation of glaze began at an air temperature −1.6°C and increasing air essure. The wind velocity prior to this formation was 10–12 m/sec. Maximum thickness was out 3 cm. The ice deposit on trees formed a fibrous structure. *Subject Headings:* **1. Glaze storms Glaze intensity 3. Temperature effects 4. Wind effects 5. Kursk Province, U.S.S.R.**

1910

3J–38 551.574.42:621.315(773)

Fowle, Frank F., **A study of sleet loads and wind velocities.** *Electrical World*, New York, 5(17):995–1000, Oct. 27, **1910.** 6 figs., 12 tables, 15 equations. **DLC**—Based on data obtained the Chicago, Ill., Weather Bureau Station between 1873 and 1910, the author has compiled tables id graphs to show probability of daily or monthly winds of certain speeds at different elevations. hen 34 actual sleet storms which occurred at Chicago from 1900–1909 are tabulated in connection ith maximum wind speeds and severity of ice. The worst occurrence was 2.5 in. of ice with a aximum wind of 53 mph. Highest speed of all was 60 mph (trace of sleet), and 86 mph (1 min.) ter a heavy glaze storm (Dec. 26, 1904) with falling temperature. Once 2 in. (diameter) of ice mained on wires several days. Downward wind motion would add to wind load, but this occurrence rare. *Subject Headings:* **1. Glaze storms 2. Glaze intensity 3. Icing of transmission lines Wind loads on wires 5. Chicago, Ill.**—*M.R.*

3J–39 551.574.42(74

Judkins, L. A., **Ice storm of January 5–6, 1910.** *Monthly Weather Review*, 38(1):3–4, Jan. **191**
DLC—In the greater portion of New Jersey, especially in the northern and some of the weste
counties, severe glaze formation at heights of 5–6 ft was observed. In many places the ice formatic
reached a thickness of $\frac{1}{2}$ to $\frac{3}{4}$ of an in. Supercooled rain falls with temperature as low as 16–17°
Subject Headings: **1. Glaze storms 2. Glaze intensity 3. Temperature effects 4. New Jersey.**

3J–40 551.574.42(4

Shipchinskiĭ, V., **Sobranie Telegrafno-Telefonnogo tekhnicheskogo obshchestva 16 noiabr**
1909 goda. [Meeting of the Telegraph-Telephone Technical Society on Nov. 16, 1909.] *Meteor*
logicheskiĭ Vestnik, 20(1):19–20, Jan. **1910. DWB**—Review of a report made by Kouzov on nume
ous cases of damage in Tambov Province during ice and snow storm on Nov. 4–6, 1909. Th
formation of this glaze was observed on the periphery of an area in southern Russia over which
cyclone passed. The thickness of ice reached $1\frac{1}{2}$ in. A speaker stated that the regions affect
mostly by glazed ice were: Rostov-on-Don-Kushevka, Kamensk-Liski, IAsinovataia-Sinel'nikov
Losovaia. Ice occurs more frequently in Nov., Jan. and March in the Rostov region. *Subje*
Headings: **1. Glaze storms 2. Glaze intensity 3. Glaze damage 4. Icing of communication wir**
5. Glaze distribution 6. Tambov Province, U.S.S.R.

3J–41 551.574.42:551.515(4

Vangengeĭm, F. P., **Ozheled' v Kurskoĭ Gubernii.** [Glaze in Kursk Province.] *Trudy*
sel'sko-khoziaĭstvennoĭ meteorologii, Leningrad, 6:29–32, **1910.** 4 figs. Also: Brounov, P. J., I
povodu zametki F. P. Vangengeĭma ob ozheledi v Kurskoĭ gub. [On F. P. Vangengeĭm's note abo
glaze in Kursk Province.] *Ibid.*, p. 33–41. 5 maps. **DLC**—Vangengeĭm describes meteorologic
conditions during glaze storm on Nov. 18, 1909 in Dmitriev county of Kursk Province. Broun
investigates the synoptic and meteorological conditions before and after this occurrence of glaz
ice and determines that there is a connection between glaze formation and eddy motions in t
atmosphere. *Subject Headings:* **1. Glaze storms 2. Atmospheric turbulence 3. Kursk Provinc**
U.S.S.R. I. Brounov, P. J.

1912

3J–42 551.574.42(4

Tol'skiĭ, A. P., **Nabliudeniie nad kolichestvom ineia, izmorozi i gololeditsy v Borovom les**
chestve Samarskoĭ Gubernii. [Observations on amount of hoar frost, rime and glaze in the Borov
Forest in Samara Province.] *Trudy po lesnomu opytnomu delu v Rossii*, **1912.** Review in: *Meteor*
logicheskiĭ Vestnik, 23(9/10):351, Sept./Oct. **1913.** table. **DWB**—A report on special observatio
carried out in 1908–1911. These observations showed a negative relation between the diameter
the wood or iron receiver and the amount of solid deposit. *Subject Headings:* **1. Glaze intensi**
2. Rime 3. Hoar frost 4. Samara Province, U.S.S.R.

1913

3J–43 551.574.42(4

Eckardt, B., **Eistau.** [Ice dew.] *Meteorologische Zeitschrift*, 48(2):106, Feb. **1913. DLC**
Brief report on a case of dew in Düren which froze during the night and later was covered by a lay
of hoar frost. *Subject Headings:* **1. Hoar frost 2. Frozen dew 3. Düren, Germany.**

1914

3J–44 551.574.42(5

Okada, T., **Notes on the formation of glaze.** *Meteorological Society of Japan, Journal*, 33(5):1
24, May **1914.** Reprint in: *Monthly Weather Review*, 42(5):284–286, May **1914.** 3 tables, 5 ref
equations. **DLC**—In the introduction, the author analyzes conditions for glaze formation esta
lished by Meinardus, Angot and others. On the basis of glazed ice observations in Japan, t
author presents some formulas for computation of rain drop temperature in cases when the dro
become undercooled by passing through a layer of cold air. The cause of this cooling must be he
conduction and evaporation. *Subject Headings:* **1. Glaze formation 2. Japan.**

3J–45 551.574.4 551.506(43

*Topolansky, Moritz, **Der Reif und Tau in Österreich bis 1.100 m. Seehöhe.** [Hoar frost a
dew in Austria up to 1100 m above sea level.] *Austria. Zentralanstalt für Meteorologie und G*
dynamik, Jahrbücher, N.S., 49:1–18, **1914.** numerous figs., tables, 3 maps in append. **DWB**
Comprehensive study of long period observations of hoar frost and dew in Austria. The annu
data of days with hoar frost and dew for the period 1895–1909 and their variations with altitu
are given. (*Same item* as 3D–82 in Apr. 1952, *MAB.*) *Subject Headings:* **1. Hoar frost 2. D**
3. Austria.

1915

3J–46 551.574.42

†Hellman, Gustav, **System der Hydrometeore.** [Classification of hydrometeors.] *Berlin. Preussisches Meteorologisches Institut, Veröffentlichungen*, No. 285, **1915.** 27 p. English translation in: *Monthly Weather Review*, 44(7):385–392, July **1916**; 45(1):13–17, Jan. **1917.** tables, refs. **DLC**—Presents complete classification scheme for hydrometeors and brief review of principal opinions on the problem of hydrometeor formation from Aristotle's time. This study contains description of hydrometeors formed by direct condensation of water vapor at the surface (dew, hoar frost, wet fog, rime, etc.) and by indirect condensation in the free air (rain, snow, hail, glazed frost, etc.) Special attention is paid to phenomena of rain and snow without clouds. The work gives a good review of the terms used in German and English to designate different hydrometeors. *Subject Headings:* **1. Hydrometeor structure 2. Hydrometeor formation 3. Ice deposits 4. Definitions 5. History of meteorology.**

1916

3J–47 551.574.42:001

Abbe, Cleveland, **American definition of sleet.** *Monthly Weather Review*, 44(5):281–286, May **1916.** 9 refs. **DLC**—Review of the Weather Bureau's important discussion on use of the terms "sleet," "ice storm," "glazed frost," "silver thaw," etc.; also about terms for rime (Rauhfrost, Duft, givre). *Subject Headings:* **1. Ice deposits 2. Definitions.**

3J–48 551.574.42(47)

Liutnitskiĭ, Anton, **Neobyknovennaia gololeditsa.** [Unusual glaze storm.] *Meteorologicheskiĭ Vestnik*, 26(1):7–10, **1916.** Unchecked.—A description of one case of intensive glazed frost observed in Novorossisk Region, and especially at the mountain station at Marchot Pass. *Subject Headings:* **1. Glaze storms 2. Glaze intensity 3. Novorossisk Region, U.S.S.R.**

3J–49 551.574.42(439.1)

Réthly, Antal, **Eisregen in Budapest.** [Glaze in Budapest.] *Meteorologische Zeitschrift*, 33(7):282–285, July **1916.** figs., 2 tables, 2 refs. **DLC**—Description of heavy glaze on March 6, 1915. The characteristic weather conditions and intensity of glazed ice deposit on trees and wires are described. *Subject Headings:* **1. Glaze intensity 2. Budapest, Hungary.**

1917

3J–50 551.574.42

Abbe, Cleveland, **Glaze, glazed roads, "Ammil."** *Monthly Weather Review*, 45(10):500, Oct. **1917.** 3 refs. **DLC**—Discussion of terms to be used for ice formation near the ground. *Subject Headings:* **1. Ice deposits 2. Terminology.**

3J–51 551.574.42(755)

Blair, William R., **Alternate deposition of rauhreif and rauheis.** *Monthly Weather Review*, 45(1):19, Jan. **1917.** fig. **DLC**—Report of an interesting case of soft and hard rime formation observed at the Mount Weather (Va.) station (1725 ft) during the night of Feb. 19–20, 1914. Describes weather conditions accompanying this formation. *Subject Headings:* **1. Rime formation 2. Mt. Weather, Va.**

3J–52 551.574.42(73)

Frankefield, Harry Crawford, **Sleet and ice storms in the United States.** *Pan American Scientific Congress, 2d, Washington, D. C., 1915–1916, Proceedings*, 2:249–257, **1917.** Author's summary in: *Monthly Weather Review*, 43(12):608, Dec. **1915. DLC**—An abstract of paper read before the Second Pan American Scientific Congress. Author gives the definition of terms, geographical and seasonal distribution of the phenomena over the United States and describes the conditions favorable for sleet and ice storms in this country. *Subject Headings:* **1. Glaze distribution 2. Glaze formation 3. United States.**

3J–53 551.574.42

Marvin, C. F., **Notes and comments on classification of hydrometeors.** *Monthly Weather Review*, 45(1):17–18, Jan. **1917.** 3 equations. **DLC**—Author remarks that the purpose of this note is: "to offer a few comments suggested by some of Dr. Hellmann's statements as indicating in some cases, possibly, the view held in the United States on the point in question and mentioning in the case of glaze the physical principles that seem to underlie and determine the formation of this hydrometeor." Emphasis given to the formation of glazed frost. *Subject Headings:* **1. Glaze formation 2. Terminology 3. Hydrometeor classification.**

1918

3J–54 551.574.42(73

Rhoades, Verne, **Ice storms in the southern Appalachians.** *Monthly Weather Review*, 46(8):373-374, Aug. **1918.** **DLC**—A brief report on damage to trees in western North Carolina and northwestern South Carolina during ice storms in the early spring of 1915. *Subject Headings:* **1. Glaze storms 2. Glaze damage 3. Southern Appalachians.**

1919

3J–55 551.574.42(47

*Kobranov, N. P., **Ozheled' v Mariupol'skom lesnichestve.** [Glaze in Mariupol' forest.] *Trudy po lesnomy opytnomu delu v Rossii*, Petrograd, v. 62, **1919.** Review in: *Leningrad. Lesotekhnicheskaia Akademiia im. S. M. Kirova, Trudy*, 47:3–5, **1936.** **DWB**—Analysis of glazed ice observations made by the author in Mariupol' Forest Experiment Station during 1911–1916. Conditions for glaze formation are discussed. *Subject Headings:* **1. Glaze 2. Forest influences 3. Mariupol', Samara Province, U.S.S.R.**

1920

3J–56 551.574.4

Brooks, Charles F., **The nature of sleet and how it is formed.** *Monthly Weather Review*, 48(2):69–72, Feb. **1920.** fig., 7 refs. **DLC**—The author studies sleet definitions, gives summary of 3 observations of the characteristics of sleet (size, form, structure, and source: rain or snow) and also shows contrasts between sleet (falling from a warm layer through a cold one), graupel (different from sleet—temperature not above freezing aloft) and hail (no cold surface layer necessary). The conditions for glaze formation are presented in a diagram. *Subject Headings:* **1. Glaze formation 2. Synoptic weather conditions 3. Definitions.**

3J–57 551.574.42(747

Manning, Douglas F., **A weather condition which produces glaze in northern New York.** *Monthly Weather Review*, 48(2):72–73, Feb. **1920.** **DLC**—Short description of synoptic condition in the New York region, which prevailed March 2 and 3 during formation of glaze. *Subject Headings:* **1. Glaze formation 2. Synoptic weather conditions 3. New York.**

3J–58 551.574.42:551.509.59(74

Meisinger, C. LeRoy, **The precipitation of sleet and the formation of glaze in the eastern United States, January 20 to 25, with remarks on forecasting.** *Monthly Weather Review*, 48(2):73–80, Feb. **1920.** 18 charts, 5 refs. **DLC**—A study of weather conditions accompanying glaze formation in the eastern United States. The author establishes an empirical relation between the distance from the wind-shift line to the 32° isotherm and width of the glazed belt for glazed ice forecasting (12–24 hours in advance). *Subject Headings:* **1. Glaze formation 2. Glaze forecasting 3. Eastern United States.**

1921

3J–59 551.525.

Bonshtedt, E., **Ledianye stebel'ki.** [Ice columns.] *Priroda*, Moscow, 9/10(10/12):73–74, **1921.** **DLC**—Description of ice crystallization phenomena observed after frost nights in mountainous regions in wind protected area. These ice crystals (from 1–2 cm up to 10–12 cm long) formed by night cooling processes, have one interesting peculiarity of carrying away particles of sand by their growing because sand is a constituent of this formation. The author remarks that these formations of hoar frost were also observed by Högbom in Russia (Samara Province and Amu Valley in Siberia), and by others in Japan and in Sweden (called "pipekrake"). Porous soil offers a source of water supply which is an important factor in ice column formation. *Subject Headings:* **1. Hoar frost formations 2. Ice columns.**

3J–60 551.574.42(750

Dole, R. M., **Ice storm and gale of January 25–27 at Wilmington, N. C.** *Monthly Weather Review*, 49(1):15–16, Jan. **1921.** **DLC**—Description of weather conditions (pressure distribution, temperature, wind, precipitation) during heavy glazed frost. *Subject Headings:* **1. Glaze formation 2. Glaze storms 3. Wilmington, North Carolina.**

3J–61 551.574.42(744):551.577.6

Henry, Alfred Judson, **Great ice storm of November 26–29, 1921, in Massachusetts.** *Monthly Weather Review*, 49(11):612, Nov. **1921.** **DLC**—Brief description of weather conditions and abstract of report by Royal Robbins. During this storm in northern New England, snowfall was over 2 f

otal amount of precipitation was more than 3 in. and temperature was 26°. In northeastern Massachusetts, particularly, the rain froze as it fell and the damage probably exceeded that of any storm on record in the same territory. More than 100,000 trees were ruined. The loss to telegraph, telephone and electric light companies is estimated at over 5 million dollars. C. F. Brooks and T. T. Howe write in the *American Meteorological Society, Bulletin:* "even the 'oldest inhabitant' admits the ice storm of November 26–29 was the worst that has been known in this section." *Subject Headings:* **1. Glaze storms 2. Glaze damage 3. Icing of wires 4. Massachusetts.**

3J–62 551.574.41 551.574.42(45)

*Passerini, Napoleone, **Un dodicennio di osservazioni drosometriche.** [Twelve years of drosometric observations.] *Congresso Internazionale di Meteorologia, Venezia, Settembre 1920, Atti,* 1921. p. 112–127. tables, refs. **DWB**—A report on special measurements of dew and hoar frost made during 1897–1908 in Florence. The frequency and monthly annual variations of dew and hoar frost amount and number of days are presented in tables and conditions of dew and hoar frost formation are discussed. (*Same item as* 3D–87 April 1951, *MAB.*) *Subject Headings:* **1. Hoar frost frequency 2. Hoar frost data 3. Dew data 4. Florence, Italy.**

3J–63 551.574.42(44)

Raymond, G., **Notice sur le climat d'Antibes.** [Remark on the climate of Antibes.] *France. Direction Générale des Eaux et Forêts. Service des Avertissements Agricoles, Bulletin,* No. 2:47–53, 1921. 4 refs. **DWB**—On p. 53 the author gives some characteristics of hoar frost formation and shows in a graph the mean annual variations of hoar frost, based on observations made during 1910–1919. *Subject Headings:* **1. Hoar frost frequency 2. Antibes, France.**

1922

3J–64 551.574.42:621.315(749)

Brooks, Charles F., **Wire specifications to reduce damage by ice storms.** *American Meteorological Society, Bulletin,* 3(3):47, March **1922. DWB**—Old specifications of New York Central lines called for test of .765 lbs per ft on telegraph and telephone wires to insure against ice damage. A load of 1.3 lbs per ft would be more realistic in view of wind loads. A storm of March 1, 1914 in N. New Jersey yielded ice loads of 1.25 lbs per ft. In Michigan reports included 2 lbs per ft of telephone wire (Feb. 21–23, 1922). *Subject Headings:* **1. Ice loads on communication wires 2. New Jersey.**—*M.R.*

3J–65 551.574.42:621.39(74)

Crunden, Allen B., **Sleet storms.** *Bell Telephone Quarterly,* 1(2):14–22, July **1922. DLC**—General remarks on effect of ice on communication wires, and added effect of wind pressure, trees or poles falling, etc. Storm of Nov. 27–29, 1921 in New England and other storms of the 1921–22 winter are described. Six million dollars worth of material (10,000 poles and 50,000,000 feet of wire, etc.) destroyed on lines of telephone and telegraph companies alone. *Subject Headings:* **1. Sleet storms 2. Icing of communication wires 3. New England.**—*M.R.*

3J–66 551.574.42:551.524(781)

Flora, S. D., **Unusual disappearance of glaze at Topeka, Kans.** *Monthly Weather Review,* 50(1):24, Jan. **1922. DLC**—Description of weather conditions accompanying glaze formation on the night of Dec. 23–24, 1921. Ice film began to disappear at a temperature of 17°F. *Subject Headings:* **1. Glaze formation 2. Temperature effects 3. Topeka, Kans.**

3J–67 551.574.42:551.515.8(73)

*Henry, Alfred Judson, Lockwood, J. E. and Seeley, D. A., **The great glaze storm of February 22–23, 1922 in the upper Lake Region.** *Monthly Weather Review,* 50(2):77–82, Feb. **1922.** 7 figs., 2 refs. **DLC**—The exceptional duration and intensity of this storm in the upper Mississippi Valley and in the states of Wisconsin and Michigan caused great damage to overhead telegraph, telephone and electric power transmission lines and to trees (in some Michigan orchards from 50 to 70% of the trees were destroyed). Several observers reported that the ice coating weighed 20 to 40 times as much as the supporting branch or wire. At Downing: "The ice granules that fell on the night of the 21st, to a depth of 6 inches, practically stopped all traffic." The usual center for such storms in Feb. is located farther to the south. This severe storm was accompanied by the following pressure distribution: 1) anticyclone in the East (the longer axis extended from Albany, N. Y. to Sault Ste. Marie, Mich.) and 2) a strong anticyclone appeared in the Canadian Northwest. A cyclone extended from the Rockies to the Pacific. Surface winds had been SEly. *Subject Headings:* **1. Glaze storms 2. Glaze intensity 3. Air mass distribution 4. Great Lakes Region, U. S.**

3J–68 551.574.42:621.315(774

Whittier, B. B., **The glaze and snow storm of Feb. 21, 22 and 23, [1922] in Michigan.** *American Meteorological Society, Bulletin*, 3(3):46–47, March **1922. DWB**—Worst glaze storm in history o region. Orchards were ruined and wires and poles down throughout central Michigan. At Ome ice 4″ thick was reported on level and 2″ on wires, with icicles in rows all along these wires. Damag estimated at 5 to 7½ million dollars. On power lines, loads up to a ton and a half on each section o cable, buckled towers right and left. Communication wires had less than 2 lbs per ft. *Subje Headings:* **1. Glaze storms 2. Icing of wires 3. Michigan.**—*M.R.*

1923

3J–69 551.574.

Peppler, W., **Reif-und Eisbildung in der freien Atmosphäre.** [Formation of rime and ice i the free atmosphere.] *Beiträge zur Physik der freien Atmosphäre*, 10:38–50, **1922–1923.** table refs. **DLC**—Discussion of the role of sublimation and supercooled water droplets in rime formatio Study of icing processes by kite flight recommended. (*Same item as* I–2, Sept. 1950, *MAB.*) *Subje Headings:* **1. Ice formation 2. Rime formation.**—*H.P.K.*

3J–70 551.574.41 551.574.4

Votey, Clara C., **Rare pictures of dew, frost and snow.** *Nature Magazine*, Washington, D. C 2(4):227–228, Oct. **1923.** 8 figs. **DLC**—A description and photographs of a spider's wheel on spear of grass, on a window pane, etc. *Subject Headings:* **1. Frost formations 2. Dew.**

1924

3J–71 551.574.42:629.135(749

Diehl, George S. (*Highlandtown, Penna.*), **Prevention of sleet trouble on high-tension line** *Electrical World*, New York, 83(4):192–193, **1924.** fig., table. **DLC**—Technical details of measure taken by Pennsylvania Water and Power Co. of Baltimore to rid high tension lines of sleet. Whe sleet storms are expected or observed by patrolmen along lines, a sleet bus is sent out, which assists i developing a "heat run" (on lines which are alternately taken out of operations) of 360–385 amps– normally enough to melt sleet in about 40 min. *Subject Headings:* **1. Ice prevention 2. Icing transmission lines 3. Pennsylvania.**—*M.R.*

3J–72 551.574.42:629.135(773

Root, Clarence J., **The glaze storm of December 17–18, 1924, in Illinois.** *Monthly Weath Review*, 52(12):585, Dec. **1924. DWB**—Territory covered was 75 mi wide and 170 mi long. N wind, but damage was terrific (excellent photographs show state of wires and trees). Weight ice was 0.5 lbs per ft of wire. It took 17 days to restore street railway service and 23 days for electr light service at Springfield, Ill. Ice stayed on trees for 17 days and on ground over 33 days. Ov 30,000 poles were down and damage to wire services (not to mention trees, etc.) was more tha $5,000,000. *Subject Headings:* **1. Glaze storms 2. Icing of wires 3. Ice storm photograph 4. Springfield, Ill.**—*M.R.*

3J–73 551.574.42(7

Stewart, W. P., **The sleet, glaze, snow, and windstorm in Wisconsin, February 3–6, 192** *Monthly Weather Review*, 52(3):163–164, March **1924. DLC**—This storm occurred in connectio with a low pressure area which came up the Mississippi Valley on Feb. 3–4 and passed slowly north east over Illinois, Indiana and Michigan on Feb. 5–6. The thickness of the glaze deposit was fro $\frac{3}{16}$ in. to $\frac{3}{4}$ in.; because of high wind, damage to wire communication systems was heavy. *Subje Headings:* **1. Glaze storms 2. Glaze intensity 3. Glaze damage 4. Icing of communication wire 5. Wisconsin.**

1925

3J–74 551.574.42(7

Brooks, Charles F., **Ice storms in central New England, April 19, 1925.** *American Meteorologic Society, Bulletin*, 6(5):82–83, May **1925. DWB**—Brief account of storm near Worcester, Mass and details of height, temperature and microclimatic effects on occurrence of glazed ice. In Ne York, Maine, New Hampshire and Vermont 11 to 16 in. of snow fell in many places. *Subject Hea ings:* **1. Glaze storms 2. New England.**—*M.R.*

3J–75 551.524.37:581.036

Coblentz, William W., **Frost flowers, the result of exudation of ice from the stems of plant** *American Forests and Forest Life*, Washington, D. C., 31(383):682–684, Nov. **1925.** 9 figs. **DLC**– Describes many cases of frost flower formation. The author presents results of experiments mad

n this problem and shows that ice fringes usually form on the dried stems of plants. On cold frosty mornings ice columns, "ground ice," form on a bare and rather wet clay soil. *Subject Heading:* **. Frost flowers.**

3J–76 551.574.42

Veĭnberg, B. P., **K teorii obrazovaniia izmorozi.** [On the theory of rime formation.] *Meteorologicheskiĭ Vestnik*, 35(5):116–117, May **1925.** ref. **DWB**—A brief study of the dependency of rime formation on speed of air flow and size of objects. In author's opinion more rime is deposited on small objects than on large ones. *Subject Headings:* **1. Rime formation 2. Wind effects.**

1926

3J–77 551.524.37:581.036.5

Humphreys, William J., **Frost-weeds.** *American Botanist*, Joliet, Ill., 32(1):18–21, Jan. **1926.** g. **DLC**—Description of frost weed or frost flowers. W. H. GIBSON says: "it is a flower of ice-crystal of purest white which shoots from the stem, bursting the bark asunder . . . it is sometimes three inches in height and an inch or more in width." *Subject Heading:* **1. Frost flowers.**

3J–78 551.574.42(47)

*Tol'skiĭ, A., **K voprosu ob izmerenii ineia i izmorozi na met. st.** [The problem of measurement of hoar frost and rime at meteorological stations.] *Meteorologicheskiĭ Vestnik*, 36(9):186–190, Sept. **1926.** 6 tables, 3 refs. **DWB**—Report on experimental measurement of hoar frost and rime amount during 1908–1915 at Borovoe Forest Experiment Station, Samara Province. The author concludes that good results can be obtained by using plates 20×25 cm. *Subject Headings:* **1. Rime measurement techniques 2. Hoar frost measurement techniques 3. Samara Province, U.S.S.R.**

1927

3J–79 551.524.37:581.036.5

Clute, Willard N., **A new frost flower.** (**Describes ice fringes on stems of Verbesina.**) *American Botanist*, Joliet, Ill., 33(1):1–2, Jan. **1927.** fig. **DLC**—On a frosty morning the author observed plants with one or more thin ribbons of ice exuding from the part of the stem near the ground. *Subject Heading:* **1. Frost flowers.**

3J–80 551.574.42(47)

Lir, E. S., **Sinopticheskie usloviia gololeda v Evropeĭskoĭ chasti SSSR.** [Synoptic conditions for glazed ice in the European part of the U.S.S.R.] *Zhurnal Geofiziki i Meteorologii*, 4:23–38, **1927.** 11 charts, ref. English summary. **DLC**—Glaze is defined as supercooled drops of rain freezing upon reaching the earth and causing a coating of ice. Synoptic examination indicates that it usually occurs on the boundaries separating an anticyclone and a region of depression. Two types of glaze are named, east type and west type, each of which corresponds to the distribution of baric centers over Europe and western Siberia. Charts indicate the location of some of the baric centers. (*Same item* as I–3, Sept. 1950, *MAB.*) *Subject Headings:* **1. Glaze 2. U.S.S.R.**—*M.R.*

3J–81 551.574.42:551.571(268)

Malmgren, Finn, **Studies of humidity and hoar-frost over the Arctic Ocean.** *Geofysiske Publikasjoner*, Oslo, 4(6), **1927.** 20 p. 17 figs., tables, equations. **DLC**—The author designed a rime and hoar frost gage on the principle of the registering balance, using a cylinder as a collector. He was able to obtain some data during the North Polar Expedition of the "Maud" and established certain relationships between the rate of deposition, wind velocity, relative humidity over ice and air temperature. He gives the following formula $M = C \cdot V \ (E' - E'_1)\tau q$, where E'—actual vapor pressure, E'_1—saturation vapor pressure, τ—time in seconds, q—effective area of collector. *Subject Headings:* **1. Rime formation 2. Rime measurement techniques 3. Rime intensity 4. Humidity effects 5. Arctic Ocean.**

3J–82 551.574.42(42)

Whipple, Francis J. W., **Rime and associated phenomena.** *Meteorological Magazine*, London, 62(735):68–69, April **1927.** **DWB**—Unusual occurrence of heavy rime during fog on Feb. 11 in the south of England. Rime was heavy enough to bend branches of trees exposed to the northeast. Rime blown from the trees was an inch deep. The rime on wiry grass stalks was of a peculiar nature the deposit on the lower half of the stalk pointed into the wind (a NE wind was blowing at time of rime formation) but on the other half it was on the lee side. *Subject Headings:* **1. Glaze storms 2. Rime 3. Southern England.**—*M.L.R.*

1928

3J–83 551.574.42:621.315(77):621.3

Brooks, Charles F., **Exceptional glaze storm in Ohio, March 29–31, 1928.** *American Meteorological Society, Bulletin*, 9(5):109, May **1928. DWB**—Glaze storm 40 to 60 mi wide in NW Ohi 150 miles NW of track of LOW center gave an inch of ice on wires. Million dollar damage to tele phone and telegraph wires was due mainly to icicles about 2 in. long which formed at the rate o 5 to 14 to each ft of wire. At Toledo ice did not form on trees, but only in the layers within 10 f of ground. *Subject Headings:* **1. Glaze storms 2. Icing of communication wires 3. Ohio.**—*M.R.*

3J–84 551.574.4

"Frost pillars." *Royal Meteorological Society, Quarterly Journal*, 54(225):18, Jan. **1928.** 2 figs **DLC**—Two photographs and brief description—one sent in Jan. 1928 from Broadstone, Dorset an the second from Japan in 1922. *Subject Heading:* **1. Frost deposits.**

1929

3J–85 551.574.42:(481

Ahlman, Hans W:son, **On the formation of hoar frost and its relation to glacial growth.** *Journal of Geology*, Chicago, 37(3):275–280, April–May **1929.** 2 figs., 7 refs. **DLC**—Report on specia observations made by the author on the summit of Mount Fanaråken in Norway (2,050 m). H establishes conditions favorable to formation of hoar frost and describes cases of intensive hoar fros formation and accompanying weather conditions. *Subject Headings:* **1. Hoar frost formatio 2. Glacial accretion 3. Fanaråken, Norway.**

3J–86 551.574.42(747

Spencer, J. H., **Ice storm of December 17–18, 1929, at Buffalo, N. Y.** *Monthly Weather Review* 57(12):508–509, Dec. **1929.** fig. **DLC**—A brief description of weather conditions accompanyin glaze formation. This storm caused $3,000,000 damage. Tree branches the size of an ordinar lead pencil were enlarged by the ice to the thickness of 1 to 1.5 in. More than 8,000 telephone pole in western New York were overturned. Another article on the same storm, "Ice storm at Buffalo N. Y.," appeared in *American Meteorological Society, Bulletin*, 11(2):50–51, Feb. **1930.** *Subject Headings:* **1. Glaze storms 2. Glaze damage 3. Buffalo, N. Y.**

1930

3J–87 551.574.42(784,783,776

Blystone, M. E., **Glaze storm in South Dakota, November 18 to 20, 1930.** *Monthly Weather Review*, 58(11):466–467, Nov. **1930.** McClurg, R. J., **The glaze storm of November 15 to 16, 193 in North Dakota and Minnesota.** *Ibid.*, p. 467. **DLC**—Description of damage done by the No vember glaze storms and of the weather conditions preceding the storm. Glazed frost condition are described. *Subject Headings:* **1. Glaze storms 2. Glaze damage 3. North Dakota 4. Sout Dakota 5. Minnesota. I. McClurg, R. J.**

3J–88 551.574.4

Humphreys, William J., **At what temperature does frost occur?** *Monthly Weather Review* 58(2):61, Feb. **1930. DLC**—Some remarks on temperature conditions during hoar frost formatio Fine, feathery ice crystals begin to form as soon as the temperature of the frosted object and the a in contact with it are 32°F. *Subject Headings:* **1. Hoar frost formation 2. Temperature effects.**

3J–89 551.574.42(98

*Koch, J. P. and Wegener, A., **Wissenschaftliche Ergebnisse der dänischen Expedition nac Dronning Louises—Land und quer über das Inlandeis von Nordgrönland 1912–1913 unter Leitu von Hauptmann J. P. Koch.** [Scientific results of the Danish expedition to Queen Louise Land an across the North Greenland glacier during 1912–1913 under supervision of Capt. J. P. Koch.] *Denmark. Kommissionen for Ledelsen af de Geologiske og Geografiske Undersøgelser i Grønlan Meddelelser om Grønland*, 75(2):405–676, **1930.** numerous figs. and tables. **DLC**—On p. 578–58 and p. 582–609, entitled: "Reif, Nebel, weisser Regenbogen" [Hoar frost, fog, white rainbows] an "Mikrophotografische Untersuchungen über Schnee- und Reifkristalle" (Microphotograph in vestigations on snow and hoar frost crystals), the frequency of hoar frost formation, description weather conditions accompanying this phenomenon and special investigation of hoar frost structu are presented and discussed. *Subject Headings:* **1. Hoar frost formation 2. Hoar frost structu 3. Greenland.**

3J–90 551.574.42:551.588.2:551.5

Rolét, Antonin, **La gelée et les végétaux.** [Hoar frost and vegetation.] *La Nature*, Pari 58(2837):177–179, Feb. 15, **1930. DWB**—A discussion of the influence of various forms of soi

deposits on vegetation. These formations depend on many factors, i.e., altitude, relief, exposure, wind direction, duration of frost period, rate of drop of air temperature, etc. Author classifies frost into 2 types: winter frost (gelées à glace or gelées noires) and spring frost (gelées blanches) formed during nocturnal cooling processes. *Subject Headings:* **1. Frost formation 2. Topographic effects 3. Wind effects.**

1931

3J–91 551.574.42:551.555(436)

Lauscher, Friedrich and Schwarz, Karl, **Über den Chlorgehalt des Nebelfrostes auf dem Sonnblick.** [On chlorine content in rime on the Sonnblick.] *Sonnblick Verein, Jahresberichte*, 50:32–34, **1931.** table. **DWB**—Results of special observations made during Aug. 1930–Sept. 1931. In 15 cases of hard and soft rime, observed in this period at 3106 m above sea level, the following content of chlorine was found: mean—0.211 mg/l, maximum—0.421 and minimum—0.0353. Chlorine content decreased during northern winds and increased during southern winds. *Subject Headings:* **1. Rime composition 2. Wind effects 3. Chlorinity of rime 4. Austrian Alps.**

3J–92 551.574.42:551.524:551.555(436,481)

Lipp, Hermann, **Über die chemische Zusammensetzung des Nebelfrostes auf der Zugspitze.** [On the chemical composition of rime on the Zugspitze.] *Sonnblick Verein, Jahresberichte*, 50:27–31, **1931.** table, 7 refs. **DWB**—Results of special investigations during Sept. 1930–July 1931. Temperature and wind conditions, thickness of rime and content of Cl, SiO_2 and Na are given for 17 cases of soft and hard rime. The author also gives a brief review of analogous observations made by Köhler in Kaafjørd (900 m), in Norway and by Albrecht on the Sonnblick. *Subject Headings:* **1. Rime composition 2. Temperature effects 3. Wind effects 4. Austrian Alps 5. Norway.**

3J–93 551.574.42(43)

§Nohascheck, Heinrich, **Der Zustand der freien Atmosphäre bei Nebelfrost- und Glatteiswetterlagen.** [State of upper atmosphere during glazed frost and rime.] *Aus dem Archiv der Deutschen Seewarte*, Hamburg, 50(3), **1931.** 19 p. 6 plates, 4 figs., 17 refs. **DLC**—An analysis of weather conditions (synoptic situation, temperature, thermal rates, wind, humidity in the upper atmosphere and near the ground) which cause glazed frost and rime formation in Germany. *Subject Headings:* **1. Glaze formation 2. Rime formation 3. Synoptic weather conditions 4. Germany.**

1932

3J–94 551.574.42:551.524.37

Boutaric, A., **Le rayonnement nocturne et la lutte contre les gelées.** [Nocturnal radiation and frost prevention.] *La Nature*, Paris, 60(2892):403–408, Nov. 1, **1932.** 5 figs. **DWB**—Study of the methods used for measurement of nocturnal radiation, and the conditions important for night cooling processes. Hoar frost forms on clear, calm nights on objects exposed to the sky when the temperature of objects falls below the freezing point. *Subject Headings:* **1. Hoar frost formation 2. Temperature effects.**

1933

3J–95 551.574.42:551.515.8(479)

Dezhordzhio, Viktor, **Gololed 13–15 dekabria 1930 g. v Krasnodarskom zheleznodorozhnom raïone.** [Glaze on Dec. 13–15, 1930, in the district of the Krasnodarsk Railroad.] *Zhurnal Geofiziki*, 3, No. 3(9):312–325, **1933.** 13 figs., 3 tables, refs. French summary. **DLC**—Detailed synoptic analysis given of a typical case of glaze icing in the northern Caucasus region. Graphs and tables present temperature, humidity, precipitation, upper air, and other conditions. The invasion of the Arctic air mass which caused the icing is traced and analyzed. (*Same item as* I–17, Sept. 1950, *MAB.*) *Subject Headings:* **1. Glaze storms 2. Arctic air masses 3. North Caucasus, U.S.S.R.**—*M.R.*

3J–96 551.574.42(756)

Pierce, L. T., **The ice storm of December 16–17, 1932 near Highlands, N. C.** *Monthly Weather Review*, 61(2):45, Feb. **1933. DLC**—Brief report on the distribution of glazed frost in North Carolina during the severe storm of Dec. 16–17, 1932. The principal area of destruction extended from Highlands, N. C., northward along the Blue Ridge for a distance of 20 to 30 mi. Light glazed frost conditions prevailed over a much wider area. *Subject Headings:* **1. Glaze distribution with height 2. Highlands, N. C.**

3J–97 551.574.42(968)

*Sverdrup, Harald Ulrik, **The Norwegian North Polar Expedition with the "Maud" 1918–1925. Scientific results.** v. 2. **Meteorology. Pt. 1. Discussion.** Bergen, **1933.** 331 p. numerous

diagrs., tables, refs. **DWB**—In Chap. 7 (p. 271–273, 2 figs., table), entitled "Hoar-frost," the autho discusses seasonal and diurnal changes in the amount of rime (called hoar frost or frost by author and also the formula by MALMGREN for definition of the amount of rime deposit. The formatio of rime is of small importance to the total snow cover in winter. *Subject Headings:* **1. Rime variation 2. *Maud* Expedition 3. Arctic expeditions 4. Arctic.**

1934

3J–98 551.574.42:551.50

Aujeszky, László, **Beszámoló a zuzmarakérdés újabb fejlödéséröl.** [Reference to a new de velopment in rime study.] *Idöjárás*, 38(11/12):233–242, Nov./Dec. **1934.** fig., 2 refs. Germa summary p. 265. **DWB**—A discussion on the importance of rime in forest and fruit economy and i communication services. Description of instruments used to measure rime intensity, methods o rime forecasting and protection from rime damage are given. *Subject Headings:* **1. Rime measure ment techniques 2. Rime forecasting 3. Rime damage protection.**

3J–99 551.574.4

Frost, R. L., **Rime caps and snow cocks.** *Monthly Weather Review*, 62(3):97, March **1934** 6 figs. **DLC**—Pictures from Fairbanks, Alaska of rime deposit on the top of a ventilator pipe an chimney top, and snow cocks formed by shifting winds around small isolated trees. *Subject Heading* **1. Rime formation 2. Snow cover 3. Fairbanks, Alaska.**

3J–100 551.574.42(474.3

Gabran, O., **Beobachtungen über Eiskristallbildungen, besonders auf ungefrorener Erdo berfläche.** [Observations on ice crystal forms, especially on non-frozen ground.] *Korrespondenz blatt des Naturforscher-Verein zu Riga*, 61:63–64, 122–125, **1934.** Also in: *Wasserkraft und Wasser wirtschaft*, Munich, 31:167–168, **1936.** Review by F. ROSSMANN in: *Meteorologische Zeitschrif* 54(8):307–309, Aug. **1937.** fig. **MH-BH**—Description of special observations carried out i Alswiki, Latvia. Special attention is paid to the investigation of various forms of mushfrost forma tion. The relation between this formation and temperature, humidity of the air, soil temperatur and types of soil is analyzed. *Subject Headings:* **1. Ice crystal formation 2. Mushfrost formatio 3. Alswiki, Latvia. I. Rossmann, F.**

3J–101 551.574.42(47

Krasnushkin, N. and Smirnov, K., **Sbornik issledovaniĭ po bor'be s gololedom.** [Collecte works on investigations of glaze damage prevention.] Moscow, **1934.** Unchecked.—Descriptio of investigations and experimental works on prevention of glazed frost damage to railroads and com munication services. *Subject Headings:* **1. Icing of communication wires 2. Glaze damage preven tion 3. U.S.S.R.**

3J–102 551.574.42(768

Williamson, R. M., **Sleet and ice storm in Tennessee on March 19, 1934.** *Monthly Weathe Review*, 62(3):97–98, March **1934. DLC**—Description of weather conditions and damage durin glaze. The thickness of glazed ice on trees, wires, etc. was as much as $\frac{3}{4}$ in. The icicles suspende from wires, branches and other horizontal objects were from 2 to 4 in. on wires and as much as 10 t 12 in. on other objects. *Subject Headings:* **1. Glaze intensity 2. Glaze damage 3. Tennessee.**

1935

3J–103 551.574.42:551.588.6(43

*Döbele, Eugen, **Die Rauhreifbruchzone im Erzgebirge.** [The zone of rime damage in the Er Mountains]. *Tharandter Forstliches Jahrbuch*, Berlin, 86(10):565–650, Nov. **1935.** map, 17 figs tables, refs. German summary p. 650. **DLC**—A comprehensive study on the problem of rim formation in mountainous regions and especially in the forests of Saxony and Bohemia. The autho analyzes conditions favorable to rime formation, describes horizontal and vertical distribution o rime deposit in forest zones. This work also contains a review of earlier investigations made sinc 1597. Rime damage regions are shown on a special map. *Subject Headings:* **1. Rime formatio 2. Rime distribution with height 3. Forest influences 4. Saxony, Germany 5. Bohemia, Czecho slovakia.**

3J–104 551.574.42:551.577.37(797

Fisher, Lawrence C., **Floods, earth and snow slides, and an ice storm, from unprecedente precipitation in the State of Washington, January 1935.** *Monthly Weather Review*, 63(2):58, Fe **1935. DLC**—Report of unusual precipitation, when 5-day amount of precipitation reached 29–3 in. and the greatest 24-hour amount in the State was 8.16 in. The rain, falling through a cold a layer, formed a heavy glazed frost deposit. In Clearbrook no temperature readings were made fro

the 22nd to the 24th of Jan. as the thermometer shelter was sealed by a coating of ice. The author notes that glazed frost is called "silver thaw" locally. *Subject Headings:* **1. Glaze storms 2. Silver thaw 3. Precipitation 4. Washington State.**

3J–105 551.574.42:551.524:551.555(479)

*Liatkovskiĭ, A., **Nabliudeniia nad izmoroz'iu na vysote 3250 m. v 1930 31 g.** [Rime observations at an altitude of 3250 m in 1930–1931.] *Klimat i Pogoda*, 11(3):14–18, **1935.** fig. tables. **DWB**—Report on special rime observations at the meteorological station at Aladez (Armenia). The rime deposit was observed on electric wires at a height of 1.5 m above surface. The relation between rime thickness and temperature and wind direction is analyzed. *Subject Headings:* **1. Rime intensity 2. Temperature effects 3. Wind effects 4. Transcaucasia, U.S.S.R.**

3J–106 551.578.41:551.574.1

Nakaya, Ukitirô and Sato, Isonosuke, **On the artificial production of frost crystals with reference to the mechanism of formation of snow crystals.** *Sapporo, Japan. Hokkaido Imperial University. Faculty of Science, Journal, Ser. 2, Physics*, 1(7):206–214, Oct. **1935.** 19 figs., 2 tables, 7 refs. **DLC**—Experiments conducted to produce frost crystals. Crystal habits and degree of supersaturation discussed. Form of crystals, temperature of air where crystal is formed, and the supersaturation ratio are tabulated. (*Same item as* C–19, March 1950, *MAB.*) *Subject Headings:* **1. Snow crystal formation 2. Temperature effects 3. Supersaturation.**—*H.P.K.*

3J–107 551.574.42

Nakaya, Ukitirô, **On the correspondence of snow and rime crystals.** *Sapporo, Japan. Hokkaido Imperial University. Faculty of Science, Journal, Ser. 2, Physics*, 1(7):201–205, Nov. **1935.** numerous photos, refs. **DLC, NN**—A classification of amorphous and crystalline forms of hoar frost and rime. The author presents 4 types of crystalline structures of these phenomena: needle crystals, featherlike crystals, plate crystals and dendritic crystals and compares them with the structure of snow crystals. *Subject Headings:* **1. Rime structure 2. Hoar frost structure 3. Crystal classification.**

3J–108 551.574.42(4)

*Prestin, Heinz, **Nebelfrostablagerungen auf europäischen Bergen.** [Rime deposits on European mountains.] Inaug.-Diss.—Friedrich-Wilhelm-Universität, Berlin, **1935.** 100 p. 40 figs., 23 tables, 42 refs. **MH-BH**—Structure and formation of hoar frost and rime, dependence of rime deposits on meterorological factors such as temperature, wind and fog, and distribution of rime on earth are discussed. Outline of research projects and various locations of mountain summits are given. Increase of rime with height noted. (*Same item as* I–22, Sept. 1950, *MAB.*) *Subject Headings:* **1. Rime formation 2. Rime structure 3. Rime distribution 4. Europe.**—*H.P.K.*

1936

3J–109 551.574.42

Baldit, A., **Sur un cas de verglas observé au Puy le 11 février 1936.** [On a case of glaze observed at Puy de Dôme on February 11, 1936.] *La Météorologie*, 3rd Ser., No. 1:61–62, Jan. **1936.** fig. **DWB**—A description of glazed frost formation and analysis of its thickness depending on the form of a branch. *Subject Headings:* **1. Glaze formation 2. Puy de Dôme, France.**

3J–110 551.574.42:551.524(796)

Elford, C. Robert, **An observation of unusual ice crystals.** *Monthly Weather Review*, 64(3):83, March **1936.** 3 figs., append. **DLC**—A description and photographs of ice crystals which were suspended $\frac{1}{4}$ to $\frac{1}{2}$ in. above black soil. The temperature during the night when these crystals were formed fell from 35° at midnight to a minimum of 31.6° at 7 a.m. *Subject Headings:* **1. Ice crystals 2. Temperature effects 3. Boise, Idaho.**

3J–111 551.574.42:581.1

Las heladas. [Hoar frost.] *Mexico. Servicio Meteorológico, Boletín Anual*, **1936.** p. 59–60. **DWB**—A discussion of conditions of hoar frost formation and its importance as an ecological factor. *Subject Headings:* **1. Hoar frost formation 2. Plant ecology.**

3J–112 551.574.42

Hrudička, Bohuslav, **Stupnice námrasku podle SUM.** [Rime scale for observations at the State Meteorological Institute.)] *Electrotechnický Obzor*, Prague, 25(4):60–61, Jan. 24, **1936.** 7 figs., ref. **DBS**—On the basis of special observations made near the National Meteorological Institute (SUM), the author presents a classification of rime. This work contains a description (with photographs) of 9 forms of rime. *Subject Headings:* **1. Rime classification 2. Prague, Czechoslovakia.**

3J–113 551.574.42:63

Kobranov, N. P., **Otlozhenia l'da na derev'iakh vo vremia ozheledi i mery bor'by s povrezh-deniiami lesov ozheled'iu.** [Ice deposit on trees and prevention of forest damage by glaze.] *Leningrad. Lesotekhnicheskaia Akademiia im S. M. Kirova, Trudy* No. 47:3–21, **1936.** 7 figs., 6 refs. German summary p. 19–20, English summary p. 20–21. **DWB**—On the basis of his own earlier investigations and observations in Minsk in 1928, the author concludes that glaze is observed most often in zones of contact between cyclonic and anticyclonic pressure systems when the air masses involved are saturated and have temperatures near the freezing point. The thickness of glaze depends on the temperature gradient, air moisture and wind velocity. Recommends special protective belts around forests, planted in places exposed to the wind, for protection of forests from glaze damage. *Subject Headings:* **1. Glaze damage prevention 2. Glaze formation 3. Forests 4. Air mass distribution.**

3J–114 551.574.42(42)

Neville, N. E., Brenton, R. S. and Porter, J., **Glazed frost and ice pellets, February 11th and 13th.** *Meteorological Magazine*, London, 71(842):42–43, March **1936. DLC**—Description of meteorological conditions before and at the time when glaze occurred over southern England. *Subject Headings:* **1. Glaze storms 2. England.**

3J–115 551.574.42(479)

Nikitin, I., **Obrazovanie izmorozi na poliane Guzeripl'.** [Rime formation in Guzeripl'.] *Klimat i Pogoda*, 11(1):30–31, **1936.** fig. **Gololeditsa na poliane Guzeripl'.** [Glazed ice in Guzeripl'.] *Ibid.*, p. 31. **DLC**—Report on weather conditions observed in winter 1934/1935 during glaze and rime formation. *Subject Headings:* **1. Glaze formation 2. Rime formation 3. Caucasus Mountains, U.S.S.R.**

3J–116 551.574.42

Seligman, G., **Snow structure and ski fields.** London, MacMillan, **1936.** 555 p. 371 figs., numerous refs. **DWB**—Review by ROBERT G. STONE in: *American Meteorological Society, Bulletin*, 18:5–10, 47–53, **1937. DLC**—Chap. 4 (p. 78–101. 22 figs., 23 refs.), entitled "Air hoar frost and rime" contains a discussion of the solid forms of water. The author analyzes conditions necessary for hoar frost and rime deposit and their structure, formation and occurrence. He pays special attention to forms of fog deposit. Numerous photographs of the many types of hoar frost and rime are presented. On p. 18–22, the author also gives a classification of various ice forms according to whether their origin is due to liquid water, to the sublimation of water vapor or to both sublimation and freezing. He presents a brief description of each of these forms with 16 photographs. *Subject Headings:* **1. Rime formation 2. Hoar frost formation 3. Frost classification. I. Stone, Robert G.**

3J–117 551.574.42

Veĭnberg, B. P., **Moroznye uzory na oknakh.** [Frost flowers on windows.] *Klimat i Pogoda*, 11(1):17–21, **1936.** 7 figs. **DLC**—An analysis of conditions for solid deposit formation by frost on different objects, especially on window panes. *Subject Headings:* **1. Frost deposits 2. Frost flowers.**

3J–118 551.574.42:551.524.3:551.553(436)

*Winter, Heinrich, **Untersuchungen über Glatteisbildung.** [Investigations of glaze formation.] *Meteorologische Zeitschrift*, 53(2):63–68, Feb. **1936.** 2 figs., 2 tables, 5 refs. **MH-BH**—The study is based on glazed frost observations at Vienna during 1905–1935. The author gives mean monthly frequency of glazed frost, analyzes weather conditions and aerological conditions during glazed frost formation and examines especially wind and temperature variations before and after glazed frost formation. *Subject Headings:* **1. Glaze frequency 2. Wind variations 3. Temperature variations 4. Long period records 5. Vienna, Austria.**

1937

3J–119 551.508.765:551.574.7:629.13

Chernysh, V. D., **Pribor dlia signalizatsii nachala obledeniia samoleta.** [Instrument for indicating the beginning of aircraft icing.] *Problemy Arktiki*, No. 5:123–124, **1937.** 2 figs. **DLC**—Description of a special installation with a photoelectric cell constructed by the author which registers the beginning of glazed deposit. *Subject Headings:* **1. Icing meters 2. Icing of aircraft.**

3J–120 551.574.42

Diem, Max, **Stengeleis.** [Mushfrost.] *Meteorologische Zeitschrift*, 54(7):267–268, July **1937.** fig., table. **MH-BH**—Some remarks on mushfrost observations in Kandel (1243 m) in the Black Forest during 1936, accompanied by air temperature measurements in Feldberg (1496 m). *Subject Headings:* **1. Mushfrost 2. Temperature effects 3. Black Forest, Germany.**

3J–121 551.574.42(747/8)

Downs, Albert A., **Glaze storm of March 17–19, 1936, in Pennsylvania and New York.** *Monthly Weather Review*, 65(3):100–101, March **1937.** fig., map, 4 refs. **DLC**—Glazed frost on March 17–19 caused great damage to timber, orchards and other property on approximately 4 million acres in New York State and 2 million acres in Pennsylvania. More intensive glaze formation was observed at altitudes above 1500 ft. No damage occurred where the minimum isotherm did not reach 32°F or lower. The regions with average minima from 29° to 32°F had partial damage. In extreme western New York and northwestern Pennsylvania, where the average minimum temperatures were below 29°, maximum damage occurred. An interesting fact was noted by some observers near Lake Ontario and within a mile of Seneca and Cayuga Lakes in New York—woodlots there were injured much less than those farther away (ameliorative effects of large bodies of water). *Subject Headings:* **1. Glaze storms 2. Glaze damage 3. Glaze distribution 4. Temperature effects 5. New York 6. Pennsylvania.**

3J–122 551.574.42

Gabran, O., **Eiskristallbildungen auf ungefrorenem Boden.** [Ice crystal formation on non-frozen ground.] *Meteorologische Zeitschrift*, 54(11):427, Nov. **1937.** 4 refs. **MH-BH**—Discussion on mushfrost formation. *Subject Heading:* **1. Mushfrost formation.**

3J–123 551.574.42(437)

†Hrudička, Bohuslav, **Zur Nebelfrostfrage.** [Problem of rime.] *Beiträge zur Geophysik*, 51:335–342, **1937.** 3 figs., numerous refs., equation. **DLC**—General review of contemporary works on rime deposits and icing in Czechoslovakia. (*Same item as* I–27, Aug. 1950, *MAB.*) *Subject Headings:* **1. Rime 2. Glaze formation 3. Czechoslovakia.**—*H.P.K.*

3J–124 551.510.42:551.578.41:551.574.42

Köhler, Hilding, **Studien über Nebelfrost und Schneebildung, und über Chlorgehalt des Nebelfrostes des Schnees und des Seewassers im Halddegebiet.** [Study on rime and snow formation and on chloride content in rime, snow and sea water in the Haldde region.] *Uppsala. Universitet. Mineralogisk-Geologiska Institut, Bulletin*, 26:279–308, June 28, **1937.** 10 figs., 7 tables. 10 refs. **DLC**—A comprehensive study of the structure and chemical composition of rime and snow. The author also investigates frequency and intensity of rime. These observations were carried out at Haldde Observatory (904 m) for many years. It was concluded that the thickness of rime depended on height above surface. The increase of thickness with height can be computed by the following formula: $M = 0.000809Z^2 + 0.004422 + 0.889$, ($Z$ in m.). *Subject Headings:* **1. Rime formation 2. Rime analysis 3. Haldde, Sweden.**

3J–125 551.574.42:551.555(434.8)

Koetzold, Bernd, **Über Rauhreiferfahrungen im Deutschen Mittelgebirge und ihre Anwendung bei Freileitungsneubauten.** [Experiences with rime in the German Mittelgebirge and their applicability to overhead communication installations.] *Electrotechnische Zeitschrift*, Berlin, 58:1, 34, **1937.** Review by Fritz Möller in *Meteorologische Zeitschrift*, 54(10):390, Oct. **1937. MH-BH**—A brief report on investigation of rime deposits in the Thuringian Forest. Observations in the first winter (1933/1934) show that rime deposit can be very high, especially during cold eastern winds. *Subject Headings:* **1. Rime intensity 2. Wind effects 3. Black Forest, Germany. I. Möller, Fritz.**

3J–126 551.574.42(474.2/3)

*†Lebedeva, Ol'ga Nikolaevna, **Klimaticheskoe opisanie Estonii i Latvii.** [Climatic description of Estonia and Latvia.] Leningrad, Gidromet. Izdat., **1937.** 72 p. 13 maps, 10 figs., 13 refs., 31 tables. **DLC**—Table 23 on p. 58 contains mean number of days with glaze. On p. 20 under the title "Gololed" (Glaze), the author describes glaze conditions in these countries. Glazed ice is usually observed not more than twice per winter season. The maximum number of days with glazed frost at Tallin and Pernan occur in Jan., in other points in Nov. or Dec. Glazed ice forms more frequently with air temperatures near the freezing point and southerly winds with velocity 4–5 m/sec. *Subject Headings:* **1. Glaze data 2. Temperature effects 3. Wind effects 4. Climatology 5. Estonia 6. Latvia.**

3J–127 551.574.42

Müller, Otto, **Bemerkungen über das Vorkommen von Kammeis.** [Remarks on mushfrost occurrence.] *Meteorologische Zeitschrift*, 54(8):305–307, Aug. **1937.** 9 refs. **MH-BH**—Brief description of some observations of mushfrost formation. The author shows that the many corresponding terms for this phenomenon in German (Kammeis, Haarfrost, Eisfilamente, Stengeleis) have only one English equivalent—"mushfrost" or in Swedish—Pipkrake. *Subject Headings:* **1. Mushfrost 2. Terminology.**

3J–128 551.508.765:551.574.7:629.13

Pagliuca, Salvatore, **Icing measurements on Mount Washington.** *Journal of the Aeronautical Sciences*, New York, 4:399–402, **1937.** 6 figs., table, 2 refs. **DLC**—Paper discusses experimental methods used on Mt. Washington for measuring rime deposits and possible application of these methods for study of icing on aircraft. Table includes results of rime deposition tests on Mt. Washington. (*Same item as* I–28, Sept. 1950, *MAB.*) *Subject Headings:* **1. Rime measurement techniques 2. Icing meters 3. Icing of aircraft 4. Mt. Washington, N. H.**

3J–129 551.574.42

Rime on wire netting. *Meteorological Magazine*, London, 72(854):41–42, March **1937.** fig. **DLC**—A description of meteorological conditions observed during rime formation. *Subject Heading:* **1. Rime formation.**

3J–130 551.574.42

Rossmann, F., **Stengeleis—Eiszapfen.** [Mushfrost.] *Meteorologische Zeitschrift*, 54(2,3):64–67, 112–113, **1937. MH-BH**—Discussion of soil and weather conditions during the formation of this phenomenon. *Subject Heading:* **1. Mushfrost formation.**

3J–131 551.574.42

Schultze, Karl, **Über die Entstehung der Eis- and Salzausblühungen.** [On the genesis of ice and salt efflorescences.] *Meteorologische Zeitschrift*, 54(11):423–426, Nov. **1937.** 15 refs. **MH-BH**—A discussion on the problem of "mushfrost" formation. *Subject Heading:* **1. Mushfrost formation.**

1938

3J–132 551.574.42(43,436/7)

Döbele, Eugen, **Beitrag zur Frage der Rauhreifbildung.** [Contribution to the problem of rime formation.] *Tharandter Forstliches Jahrbuch*, Berlin, 89(6):424–435, **1938.** 3 figs., table, ref. **DLC**—This study gives supplementary material to investigations published in 1935 and contains special observations carried out in the mountains of Saxony and Bohemia and also in the Thuringian Forest and Rhön Range of Germany and in lower Austria during 1935, 1936. Tables and a special review of observations of fog duration and rime formation are presented. *Subject Headings:* **1. Rime formation 2. Mountain meteorology 3. Germany 4. Austria 5. Czechoslovakia.**

3J–133 551.574.42:551.311.12 551.578.46(481,498,8,54)

Loewe, Fritz, **The amount of rime and snowdrift as factors in the mass balance of glaciers.** *International Union of Geodesy and Geophysics. Association of Hydrology. Bulletin* No. 23:415–421, **1938.** 19 refs. **DWB**—Rime has some importance on the mass balance of glaciers, but it is difficult to measure. The author discusses in detail the conditions in air and in the upper layers of snow cover which result in rime formation. Heavy deposits of rime will be found in those regions where strong, damp winds, blowing from the sea against a mountain barrier, rise and undergo adiabatic cooling. These effects were observed in the mountains of Norway, in the coastal ranges of Alaska and especially in southern Patagonia. Another region favorable for rime deposits is the higher part of tropical mountains, where the heavy firn cover of many very steep mountain walls is usually formed by rime and not by falling snow. This type of deposit was found on the higher ridges of Kanchenjunga but not in the Alps. A review of the work done by many investigators on weather conditions (especially temperature and wind velocity) favorable for intensive rime formation is included. *Subject Headings:* **1. Rime formation 2. Snow cover 3. Orographic effects 4. Glacial accretion 5. Norway 6. Alaska 7. Patagonia 8. Himalayas.**

3J–134 551.574.42(495)

*Mariolopoulos, Elias G. **To klima tes Ellados.** [The climate of Greece.] Athens, **1938.** 370 p. charts, tables, refs. In Greek. **DWB**—In Chap. 12 (p. 245–251), entitled "Dew, hoar frost, silver frost and ice frost," the author describes frequency and distribution of these hydrometeors in Greece. For dew and hoar frost, comparative tables of number of days in two points at Athens (Botanic Garden and Astronomic Observatory) are given. Conditions for glazed ice and rime formation, and damage caused by these phenomena are treated briefly. *Subject Headings:* **1. Frost deposits 2. Greece.**

3J–135 551.574.42:551.555

Moss, R., **"Abraded" rime.** *Royal Meteorological Society, Quarterly Journal*, 64(273):44–45, Jan. **1938.** 2 figs. **DLC**—A report on rime observation showing a relation between intensity of rime formation and winds (velocity and direction). *Subject Headings:* **1. Rime intensity 2. Wind effects.**

3J–136 551.574.42:551.579.1

†Pagliuca, Salvatore, **On the methods of estimating the contribution to run-off of frozen fog deposits on mountains.** *International Union of Geodesy and Geophysics. Association of Hydrology, Bulletin* No. 23:571–585, Sept. **1938.** 8 figs., table, 25 refs. **DWB**—A review of principal works on rime formation and methods of measurements of rime amount. The author concludes that it is difficult at this time to derive any general conclusion on the importance of the water contribution from rime. In the appendix a brief discussion of ice tests on Mt. Washington, N. H., is given. *Subject Headings:* **1. Rime formation 2. Rime measurement techniques 3. Mt. Washington, N. H.**

3J–137 551.574.42(43)

*Rink, Josef, **Die Schmelzwassermengen der Nebelfrostablagerungen.** [The amount of water from rime deposits.] *Germany. Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 5(7), **1938.** 26 p.+3 plates, 20 tables, 5 refs. **DLC**—Results of systematic measurements with experimental plates during 1936 and 1937 at Schneekoppe (1602 m), accompanied by detailed analysis of meteorological and synoptic conditions during glaze and rime formation and illustrated with many photographs of ice deposits. Glaze was mainly observed with air temperatures from 0° to −3°C, and rime formation with temperatures lower than −3°C and more frequently about −4°C. *Subject Headings:* **1. Rime formation 2. Glaze formation 3. Schneekoppe, Germany.**

3J–138 551.574.42

Stoye, K., **Stengeleis.** [Mushfrost.] *Meteorologische Zeitschrift*, 55(3):113, March **1938.** **DLC**—Some remarks on "mushfrost" formation. *Subject Heading:* **1. Mushfrost formation.**

3J–139 551.508.79

Turoverov, Konstantin S., **O kombinirovannom gololednom samopistse TNIGS.** [Combined glazed ice recorder of the Transportation Scientific Research Glaze Investigation Station.] *Meteorologiia i Gidrologiia*, 4(11–12):155–158, Nov.–Dec. **1938.** 4 figs. **DLC**—Description of an instrument constructed at the experimental station at Novo-Piatigorsk and some preliminary results of its work. *Subject Heading:* **1. Glaze recorders.**

1939

3J–140 551.508.79

Bagossy, Béla, **Zuzmaravastagság-merö keszülék.** [Instrument for distant measurement of rime thickness on open wires.] *Idöjárás*, 43(11/12):229–230, Nov./Dec. **1939.** 3 figs. In Hungarian and German (p. 263–264); Italian, French and English summaries p. 263. **DLC**—Author describes an apparatus used on the 100 kV network of the Hungarian Trans-Danubian Electric Co. Ltd., permitting the quick and easy distant-measurement of the outside diameter of rime. *Subject Heading:* **1. Rime instruments.**—*Author's abstract.*

3J–141 551.574.42

Barray, A. **Effets du givre sur les lignes aériennes de transport d'énergie électrique.** [Effects of rime on electric power transmission lines.] *La Météorologie*, 3rd Ser., No. 2:128–129, March–April **1939.** 2 figs. **DWB**—An analysis of conditions of ice formation on overhead wires. Icing usually occurs when temperatures are below the freezing point at −6°, −7°C. The weight of ice deposit, accompanying winds and the twisting of wires cause most damage to transmission lines. Special observations in France show the increase in weight of ice deposit with height above sea level. For heights up to 700 m the weight of ice deposit was up to 3 kg/m; up to 900 m—5 kg/m; up to 1090 m—9 kg/m and in Grand-Bois (1200 m) it was up to 12 kg/m. *Subject Headings:* **1. Ice formation 2. Vertical distribution of ice deposits 3. Icing of transmission lines 4. France.**

3J–142 551.574.42:001

Bianki, A. V., **K voprosu ob opredelenii poniatiĭ ineĭ, izmoroz', tverdyĭ nalet i gololeditsa.** [On the problem of definition of terms: hoar frost, rime, solid deposit and glazed frost.] *Problemy Arktiki*, Leningrad, No. 7–8:118–123, **1939.** ref. **DLC**—The author discusses and defines the types of hydrometeors and presents the opinions of Bergeron, Khromov and others. He also analyzes the conditions necessary for dew, hoar frost, rime and glaze formation and suggests that the origin of these phenomena should be the subject of investigations at observatories and research stations. *Subject Headings:* **1. Hydrometeors 2. Definitions.**

3J–143 551.574.42:551.524:551.55(44)

Bricard, Jean, **Étude sur la formation du givre au sommet du Puy de Dôme.** [Study on rime formation at the summit of Puy de Dôme.] *Académie des Sciences, Paris, Comptes Rendus*, 208: 1236–1238, April 17, **1939.** 2 tables, 3 refs. **DLC**—Special experiments on microscopic structure of

rime. The author establishes the relation of formation to size of droplets, air temperature and wind velocity. *Subject Headings:* **1. Rime structure 2. Temperature effects 3. Wind effects 4. Puy de Dôme, France.**

3J–144 551.574.42:551.524

Gaponov, B. S., **Temperaturnye granitsy osedaniia gololeda i izmorozi is pereokhlazhdennogo tumana.** [Temperature limits for glaze and rime formation from supercooled fog.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr. i Geofiz.*, 3(2):205–216, **1939.** 2 figs., 3 tables, 6 refs. German summary p. 216. **DLC**—Some remarks on the physical basis for glaze and rime formation. Description of investigation based on 44 years of observation at Odessa Geophysical Observatory. The author concludes that glaze formation can be observed with fog at temperatures from 0°C to −2.2°C, and rime below −1.2°C. In the interval between −1.2°C and −2.2°C glaze and rime formation are both possible. The most favorable temperatures for glaze formation are near 0°C. *Subject Headings:* **1. Glaze formation 2. Rime formation 3. Temperature effects 4. Odessa Observatory, U.S.S.R.**

3J–145 551.574.42

L'Hermitte, J., **Vibrations des conducteurs d'énergie électrique recouverts d'une couche de givre.** [Vibrations of electric power transmission lines covered by rime.] *Revue Générale de l'Électricité.* Paris, 45:516–518, **1939.** ref. **DLC.**—Analysis of observations made by the author and theory on the cause of this phenomenon. *Subject Headings:* **1. Rime effects 2. Icing of transmission lines.**

3J–146 551.574.42

Ivanov, B. G., **Tverdyĭ gidrometeor ne predusmotrennyĭ instruktsieĭ.** [Solid hydrometeor unspecified by instructions.] *Meteorologiia i Gidrologiia*, No. 7/8:179–180, July/Aug. **1939. DWB**—This crystalline deposit was observed in Sabline near Leningrad during frost weather in late autumn. The soil surface was covered with thinly laminated deposits like frost flowers observed on windows. The cause of this formation is water vapor evaporating from the soil and immediately condensing on the soil surface. *Subject Headings:* **1. Frost deposits 2. Evaporation 3. Leningrad Area, U.S.S.R.**

3J–147 551.574.42(481)

Lamb, H. H., **Climate and legend in Norway.** *Royal Meteorological Society, Quarterly Journal* 65(282):510, Oct. **1939.** 4 figs. **DLC**—Photographs, taken on March 6, 1939 show trees at Gansdal (2,500 ft) covered by various forms of ice deposit (probably glazed frost and rime). *Subject Headings:* **1. Glaze photographs 2. Gansdal, Norway.**

3J–148 551.574.42:551.526.1

Mézin, M., **Fleurs de glace sur le lac de Saint-Point.** [Frost flowers on Saint-Point Lake.] *La Météorologie*, Paris, 3rd Ser., No. 3:187–189, May/June **1939.** 2 figs. **DWB**—A description of frost flowers observed Feb. 10, 1939 on the ice-covered surface of the lake; air temperatures were −10°, −15°C. *Subject Headings:* **1. Frost flowers 2. Temperature effects.**

3J–149 551.574.42:06(47

Minas'ian, V., **O sluzhbe gololeda.** [The glazed ice service.] *Meteorologiia i Gidrologiia*, No. 7/8:184–185, **1939. DLC**—Projected work of the glaze investigation program in U.S.S.R. briefly described. (*Same item as* I–50, Sept. 1950, *MAB.*) *Subject Headings:* **1. Glaze warning service 2. Meteorological services 3. U.S.S.R.**

3J–150 551.574.42(47

Skobtsev, K. K., **Sostoianie i perspektivy razvitiia gololednoĭ sluzhby.** [Status and outlook for the development of the glaze-service.] *Meteorologiia i Gidrologiia*, No. 7/8:169–172, July–Aug. **1939.** 2 figs. **DLC**—The author points out the damage caused by glaze to the economy of the U.S.S.R. and reports on the measures proposed for its prevention. The paper includes a map of distribution of instruments (to be installed) for glaze observations. (*Same item* as I–52, Sept. 1950, *MAB.*) *Subject Headings:* **1. Glaze warning services 2. U.S.S.R.**—*C.K.*

3J–151 551.574.42:551.553(477

Turoverov, K. S., **K voprosu analiza sushchestvuiushchikh sposobov vychisleniia gololednyk i vetrovykh nagruzok.** [On the problem of analyzing existing methods of computing glaze and wind loads.] *Meteorologiia i Gidrologiia*, No. 7–8:57–67, **1939.** 2 figs., 7 tables, 41 refs. **DLC**—Author considers the problem of glaze in relation to wind, using observations from the southeastern

part of European U.S.S.R., and concludes that heavy loads of glaze are usually accompanied by high wind speed. Some characteristics of the synoptic conditions accompanying such glaze formation re given. (*Same item as* I 53, Sept. 1950, *MAB.*) *Subject Headings:* **1. Icing of transmission lines . Wind loads 3. European U.S.S.R.**—*H.P.K.*

3J–152 551.574.42

§Viaut, André, **Étude sur le givrage.** [Study on ice formation.] *La Météorologie*, 3 Ser., **1939.** 159–186. 23 figs. **DWB**—Extensive investigation made of general and local meteorological conditions which cause icing and of methods of avoiding or minimizing the effects of icing. Synoptic erological analyses are made of several specific examples. (*Same item* as I–55, Sept. 1950, *MAB.*) *Subject Headings:* **1. Icing of aircraft 2. Glaze formation 3. Icing prevention.**—*H.P.K.*

1940

3J–153 551.574.42:551.515.8:551.55(44)

Bricard, Jean, **Recherches des corps qui se trouvent dans le givre.** [Investigations of rime omposition.] *Revue Scientifique*, Paris, 78(1):35–36, Jan. **1940.** table, ref. **DLC**—Report of nvestigations made during the winter of 1938-1939 at Puy de Dôme. These observations showed he variations of contents of Cl, NO^2, NO^3 and NH^3 in rime, depending on the characteristics of air nasses and wind direction. *Subject Headings:* **1. Rime composition 2. Air mass characteristics . Wind effects 4. Puy de Dôme, France.**

3J–154 551.574.42(42)

Cave, C. J. P., **The ice storm of January 27 29, 1940.** *Royal Meteorological Society, Quarterly Journal*, 66(285):143–150, April **1940.** 4 figs. **DLC**—Description of meteorological conditions during this glaze storm, intensity of ice deposit and damage to wires, trees, animals, etc. in various parts of England. The second part of this report contains a discussion on the problem of glaze ormation. *Subject Headings:* **1. Glaze storms 2. Glaze intensity 3. Glaze damage 4. England.**

3J–155 551.574.42

Coste, J. H., **The trapping of air in the formation of rime.** *Royal Meteorological Society, Quarterly ournal*, 66(286):365–366, July **1940.** 2 refs. **DLC**—Some remarks on relation between forms of olid condensation and gases in water vapor. A clearer and more notable product is obtained from as-free water. *Subject Heading:* **1. Rime formation.**

3J–156 551.574.42(42)

Croome, W. I., **Account of the formation of ice on vegetation at Bagendon near Circencester, n the Cotswolds, Glos.** *Royal Meteorological Society, Quarterly Journal*, 66(285):150–151, Apr. 940. **DLC**—A description of weather conditions during the glaze storm of Jan. 27, 1940. Area nd extent of damage and some measurements of glazed frost intensity are given. *Subject Headings:* **Glaze storms 2. Cotswold Hills, England.**

3J–157 551.574.42:551.594.25

Findeisen, W. (*Friedrichshaven*), **Über die Entstehung der Gewitterelektrizität.** [On the origin f thunderstorm electricity.] *Meteorologische Zeitschrift*, 57(6):201–215, June **1940.** 10 figs., refs. **DWB**—The author presents detailed laboratory studies on electrical phenomena in a rime nd ice layer during sublimation and evaporation of ice and applies the results to thunderstorm clouds. he charge change of a cooled body was investigated, on the surface of the rime that was formed hrough sublimation. A rapid position charging of the electrostatic system (up to 2 volts) was bserved, as long as the sublimation continued. It was found that in first approximation

$$t_s \infty \sqrt{\frac{1}{v}} \left(\frac{dV}{dt} \right)_{\text{average}} \infty \sqrt{\frac{1}{v}}$$

—direction of sublimation and charging, v—wind velocity, V—charge. The most rapid and the reatest final charge during rime formation occurred at low wind speeds. The amount of rime was ot dependent on the wind velocity. This charging phenomenon is explained by the formation of nall ice splinters, a necessary condition. The evaporation process of ice causes negative charges; uch greater charges were observed than during sublimation on experimental result—12 volts). ositive charging (up to 3.5 volt) was observed when small water droplets froze on bodies (formation glazed ice). The charge increase was observed only during the rapid freezing of water droplets nd discontinued when a water skin was formed. *Subject Headings:* **1. Rime charges 2. Electrical harges on rime 3. Sublimation 4. Evaporation of ice 5. Thunderstorm physics.**—*A.A.*

3J–158 551.574.42 551.555.

Götz, F. W. Paul, **Sahara Sand im Rauhreif.** [Sahara sand in rime.] *Zeitschrift für angewandte Meteorologie*, 57(11):360–361, Nov. **1940.** ref. **DWB**—A brief report on rime formation containing Sahara sand observed in the Alps in the summer of 1937. This phenomenon was observed during föhn winds. *Subject Headings:* **1. Rime analysis 2. Dust content of rime 3. Föhn effects 4. Alps.**

3J–159 551.574.42(42

Gunther, E. R., **Unusual ice formation in Wiltshire.** *Nature*, London, 145(3672):428, March 16, **1940.** fig., 5 refs. **DLC**—A description of weather conditions before the glaze storm of Jan 27–29, 1940 which caused great damage. Around telegraph wires the ice was $\frac{3}{4}$ in. in diameter *Subject Headings:* **1. Glaze storms 2. Icing of communication wires 3. Wiltshire, England.**

3J–160 551.574.42(43

*†Mrose, Hellmut, **Chemische Untersuchung von Rauhreifschmelzwasser in Thüringen.** [Chemical investigation of melted rime in Thuringia.] *Zeitschrift für angewandte Meteorologie*, 57(8):241–254, Aug. **1940.** table, 12 refs. **DWB**—A detailed summary of investigations which were made previously on the problem of rime analysis. The author presents results of these analyses and describes methods used by investigators. *Subject Headings:* **1. Rime analysis 2. Thuringia Germany.**

3J–161 551.574.42(42

Newbold, A. A., **Ice formation in Worcestershire.** *Nature*, London, 145(3674):514–515 March 30, **1940.** fig. **DLC**—Brief characteristics of intensity of the ice storm of Jan. 27, 1940 Roads were covered by a sheet of ice 6 in. thick on Broadway Hill. The author measured one telegraph pole guy 18 in. in circumference. *Subject Headings:* **1. Glaze storms 2. Glaze intensity 2. Worcestershire, England.**

3J–162 551.574.42(42

Pattinson, J. and Dines, J. S., **Glazed frost, January 1940.** *Meteorological Magazine*, London 75(889):12–14, **1940.** 2 figs. **DLC**—Remarks on the intensity of glaze in London. During the severe glaze storm of Jan. 1940, a piece of broken telegraph wire, 4.5 in. long and .05 in. in diameter weighed 178 gm, 130 times the weight of the wire alone. The cylinder of ice formed around the wire was 2.4 in. in diameter. *Subject Headings:* **1. Glaze intensity 2. London, England.**

3J–163 551.574.4

Seligman, G., Trendell, E. R., **Photographs of rime.** *Royal Meteorological Society, Quarterly Journal*, 66(283, 285):80, 214, **1940.** 2 figs., photo, refs. **DLC**—Brief description of conditions favorable for rime and hoar frost formation. One photograph shows $1\frac{1}{2}$ in. of rime which formed on branches during föhn on the night of Jan. 29–30, 1939 on the outskirts of Oslo. Brief note accompanies plates. *Subject Headings:* **1. Rime 2. Föhn effects 3. Oslo, Norway.**

3J–164 551.574.4

The glazed frost of January 1940. *Meteorological Magazine*, London, 75(890):21–26, March **1940.** 6 figs. **DLC**—Summary of reports by observers of this very severe occurrence in England and Wales, with photographs. A map shows isochrones of beginning of frost and position of a cold front moving SW. *Subject Headings:* **1. Glaze 2. England.**

3J–165 551.574.4

Wall, E. and Huss, Ed., **Einige merkwürdige und wenig bekannte Kristallizations-Erscheinungen des Eises.** [Some remarkable and little known crystallization phenomena of ice.] *Zeitschrift für angewandte Meteorologie*, 57(3):84–90, March **1940.** 10 figs. **DWB**—Description of rare forms of solid deposit and conditions accompanying their formation. *Subject Heading:* **1. Ice deposit formations.**

3J–166 551.574.42:551.52

Yosida, Zyungo, **Window hoar crystals on clean glass surfaces.** *Sapporo, Japan. Hokkaido Imperial University, Faculty of Science, Journal, 2nd Ser., Physics*, 3(2):43–55, **1940.** fig., 4 plates refs. Review by Karl Keil in: *Zeitschrift für angewandte Meteorologie*, 57(6):199–200, **1940. DWB**—A report on observations carried out with special experimental apparatus to determine characteristics of ice formations on window panes or other glass surfaces. It was found that similar crystal formations were produced under identical conditions. *Subject Headings:* **1. Frost flowers 2. Solid deposit 3. Temperature effects. I. Keil, Karl.**—*M.R.*

3J–167 551.574.42(479)

Zamorskiĭ, Aleksandr D., **Gigantskaia izmoroz'.** [Gigantic rime deposit.] *Priroda*, Moscow, 29(2):64–65, Feb. **1940.** **DLC**—The area around Pyatigorsk (North Caucasia) is noted for its intensive ice formation. The author describes one case of rime formation (Jan. 24–28, 1939) when $7\frac{1}{2}$ m of rime formed on metallic tubes of a triangulation tower located near Pyatigorsk. *Subject Headings:* **1. Rime intensity 2. Pyatigorsk, U.S.S.R.**

3J–168 551.574.42:551.524:551.55(479)

*Zikeev, N. T., **Gololed v Rostovskoĭ oblasti Krasnodarskom Krae.** [Glazed ice in the Rostov and Krasnodar districts.] Rostov-on-Don, BRIS Rostovskogo Upravleniia GMS, **1940.** 32 p. fig., 12 tables. **DWB**—Report on observations of the period 1925–1939. Tables and a chart show the distribution of glaze and rime over the area. Analysis is made of temperature and wind conditions accompanying the glaze formation. (*Same item as* I–66, Sept. 1950, *MAB.*) *Subject Headings:* **1. Glaze distribution 2. Rime distribution 3. Temperature effects 4. Wind effects 5. Rostov Region, U.S.S.R. 6. Krasnodar Territory, U.S.S.R.**—*M.R.*

3J–169 551.574.42(479)

*Zikeev, N. T., **Gololed v Stalingradskoĭ oblasti i Kalmytskoĭ ASSR.** [Glazed ice in Stalingrad area and Kalmuk ASSR.] Rostov-on-Don, BRIS Rostovskogo Upravleniia GMS, **1940.** 30 p. figs., 12 tables. **DAMS**—A work similar to that for the Rostov and Krasnodar areas (*see* 3J–168 above) for the territory of Stalingrad area and Kalmuk ASSR. (*Same item* as I–67, Sept. 1950, *MAB.*) *Subject Headings:* **1. Glaze distribution 2. Rime distribution 3. Stalingrad Area, U.S.S.R. 4. Kalmykia, U.S.S.R.**—*M.R.*

1941

3J–170 551.574.42:551.524

Ikeda, S., **The structure of the silver thaw and its temperature.** *Meteorological Society of Japan, Journal*, 19(5):195–199, May **1941.** English summary p. 42. 8 figs., ref. **DWB**—A report on special investigations of temperature differences between silver thaw and free air. These observations were made by means of a mirror galvanometer using a thermocouple. It was observed that the temperature rises more in natural silver thaw (of supercooled water drops) than in rime (consisting mostly of snow crystals). *Subject Headings:* **1. Solid deposits 2. Silver thaw 3. Temperature effects.**

3J–171 551.574.42(43)

Kerschus, W., **Über eine aussergewöhnlich starke Rauhreifbildung.** [Unusual intensity of rime formation.] *Meteorologische Zeitschrift*, 58(7):260, July **1941.** fig. **DWB**—Rime formation on the Brocken can be observed during three seasons—summer, autumn and winter. A deposit of rime of 103 cm is sometimes observed on the corner of thermometer screens. *Subject Headings:* **1. Rime formation 2. Rime intensity 3. Brocken, Germany.**

3J–172 551.574.42

Kreutz, Wilhelm, **Ein Beitrag zum Nebelfroststudium.** [A contribution to the study of rime.] *Zeitschrift für angewandte Meteorologie*, 58:137–150, **1941.** 11 figs., 3 tables, ref. **DWB.** Reviewed by J. Pauly in *La Météorologie*, 3rd Ser., **1941.** p. 88–89. **DWB**—Many excellent photographs show rime and ice formations on trees and experimental objects and rods of various diameters, sizes, shapes and substances (copper, iron, aluminium, wood, glass), with quantitative measurements tabulated and compared graphically for the different forms and different substances respectively. The thickness and density of ice was carefully measured and the direction of wind taken into consideration. (*Same item* as I–71, Sept. 1950, *MAB.*) *Subject Headings:* **1. Rime effects. I. Pauly, J.**—*M.R.*

3J–173 551.574.4 551.575

Lampadius, G., **Nebelfrostablagerungen sowie Tau- und Nebelniederschlag.** [Rime deposits and dew and fog precipitation.] *Tharandter Forstliches Jahrbuch*, Berlin, 92(9–10):545–584, **1941.** 6 figs., 6 tables, 28 refs. **DLC**—A comprehensive study of the problem of dew, hoar frost and rime formation with an analysis of temperature, relative humidity, winds and weather conditions. The author also pays special attention to fog precipitation in mountain regions. *Subject Headings:* **1. Rime 2. Fog 3. Dew.**

3J–174 551.574.42:551.521.2(44)

Lepape, Adolphe and Colange, Georges, **Sur la formation de la glace, en été, dans les coulées volcaniques d'Auvergne.** [On ice formation during summer in lava flow in the Auvergne.] *Aca-*

démie des Sciences, Paris, Comptes Rendus, 213:292–294, Aug. 25, **1941.** 4 refs. **DLC**—A report on the phenomenon of ice formation in depressions of solidified lava. From Arago (1828) to the present, many investigators have studied the causes of this formation and the usual explanation is that the frost forms by radiational cooling and depends on physico-chemical properties of lava. *Subject Headings:* **1. Ice deposits 2. Lava 3. Radiational cooling 4. Auvergne, France.**

3J–175 551.574.42(479)

*Zikeev, N. T., **Gololed v Ordzhonikidzevskom Krae, Checheno-Ingushetskoĭ ASSR, Severo-Osetinskoĭ ASSR i Kabardino-Balkarskoĭ ASSR.** [Glaze in the Ordzhonikidzev area, etc.] Rostov-on-Don, **1941.** 24 p. 3 figs., 14 tables, 7 refs. **DAMS**—Observations kept from 1925–1939, and particularly those from Novo-Pyatigorsk are investigated and analyzed. Tables show distribution of glaze and rime in the territory and accompanying temperature and wind conditions. Influence of orographic features considered. Classification of glaze formation is set up, based on specific gravity. Author suggests a scheme of regionalization based on intensity of glaze formation and wind velocity in the presence of glaze. (*Same item* as I–73, Sept. 1950, *MAB.*) *Subject Headings:* **1. Glaze distribution 2. Rime distribution 3. Temperature effects 4. Wind effects 5. Orographic effects 6. Caucasia, U.S.S.R.**—*M.R.*

1942

3J–176 551.574.42

Arenberg, D. L. and Elsner, R. W., **The microscopic structure of rime.** *American Meteorological Society, Bulletin*, 23:276–280, June **1942.** 10 figs., 8 refs. **MH-BH**—Includes 10 photomicrographs of rime on glass slides and analysis of each. (*Same as* I–75, Aug. 1950, *MAB.*) *Subject Headings:* **1. Rime structure 2. Photomicrographs.**

3J–177 551.574.42

Crestani, Giuseppe, **Alcune considerazioni e proposte sulla nomenclatura delle formazioni di ghiaccio sugli ogetti.** [Some considerations and proposals on nomenclature of ice formation deposited upon objects.] *Revista di Meteorologica Aeronautica*, 6(1):3–14, Jan. **1942.** 9 figs., table, 23 refs. **DLC**—Study of conditions of solid deposit formation and damage caused by this phenomenon. The author reviews terms used in Italy—hoar frost (brina), soft rime (galaverna), hard rime (calabroza) and glazed frost (vetrone or gelicidio). *Subject Headings:* **1. Glaze 2. Rime 3. Hoar frost 4. Terminology.**

3J–178 551.574.42:621.3

Eredia, Filippo, **I depositi di ghiaccio sui conduttori delle linee aeree.** [Ice deposit on conductors of overhead lines.] *Annali dei Lavori Pubblici*, Rome, v. 1, **1942.** Review by E. Cecchini in: *Rivista di Meteorologia Aeronautica*, 6(2):80–82, April **1942.** **DLC**—Two types of ice formation, glaze and rime, are important for overhead lines. Glaze is more important because it has greater specific gravity. With air temperatures near the freezing point, ice deposits cause great damage in Italy, especially in areas with uneven terrain. The author also investigates the relation between thickness of ice deposit, wind velocity and height of wires above the ground. *Subject Headings:* **1. Glaze 2. Rime 3. Wind effects 4. Icing of transmission lines 5. Italy. I. Cecchini, E.**

3J–179 551.574:63

Lehmann, Paul and Schanderl, Hugo, **Tau and Reif; Pflanzenwetterkundliche Untersuchungen.** [Dew and hoarfrost; agricultural meteorological investigations.] *Germany. Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 9(4), **1942.** 20 p.+8 figs., tables, 17 refs. **DLC**—A dissertation on the formation and evaporation of dew and frost, including a detailed discussion of instruments for measuring dew and moisture (lysimeters, dew recorders, etc.); and botanical considerations such as transpiration; use of dew by plants; the effect of artificial factors such as wind breaks (trees, hedges, fences, etc.), irrigation, fertilizer, root systems, various leaf surfaces, etc., on dew formation or evaporation, as well as the variations in meteorological elements such as radiation, temperature, humidity and wind. (*Same item* as 8–84, Aug. 1950, *MAB.*) *Subject Headings:* **1. Dew 2. Hoar frost 3. Agricultural meteorology.**—*M.R.*

3J–180 551.574

Whipple, F. J. W., **The persistence of dew.** *Royal Meteorological Society, Quarterly Journal*, 67(290):152, **1941;** 68(297):278, Oct. **1942.** 2 tables. **DLC**—Brief report on special observations made at Kew Observatory during 1940 and 1941. Tables of frequency of hoar frost and dew are given. (*See also item* 3D–171, April 1952, *MAB.*) *Subject Headings:* **1. Hoar frost frequency 2. Dew frequency 3. Kew Observatory, England.**

1943

3J–181 551.574.42

Gonchukov, V. I., Petrinskii, E. N. and Pustovoĭtov, L. F., **Pamiatka po bor'be s gololedom na provodakh sviazi.** [Memoir on prevention of ice crust on communication wires.] Moscow, Gos. transp. zheldor. Izd-vo., **1943.** 19 p. 6 tables. **DLC**—A short description of the types of ice formation and weather conditions accompanying these phenomena. Types of damage caused by formation of glaze and rime are given. Danger increases with wind. In the U.S.S.R. four types of wire communication lines are used. In regions with slight thickness of glaze wires 5 mm diameter are sufficient; in regions with moderate glaze formation, wires of 10 mm in diameter are suitable; in regions with heavy glaze deposits, (up to 50 mm and more) wires of 15 and 20 mm. in diameter are necessary. In conclusion, the authors present a description of various forms of installations of poles for prevention of glaze damage. The removal of ice from the wires by means of long bamboo poles is recommended. *Subject Headings:* **1. Glaze types 2. Rime 3. Glaze damage 4. Glaze damage prevention 5. Icing of communication wires.**

3J–182 551.574.42:551.594

†Lange, E., **Polarisationseinflüsse auf Voltapotentiale von Reifschichten.** [Polarization influence on potential (charges) from hoar frost layers.] *Meteorologische Zeitschrift*, 60(5):154–161, May **1943.** Part II. *Ibid.*, No. 9:303–314, Sept. **1943.** 7 figs., 2 tables, 34 refs. **MH-BH**—A special theoretical, experimental study on polarization resistance and dielectric properties of ice and in particular of hoar frost. *Subject Heading:* **1. Electrical properties of hoar frost.**

3J–183 551.574.42(798)

*MacDonald, Torrence F., **Glaze and high winds at Fairbanks, Alaska and Nome, Alaska (1936–1940).** U. S. Weather Bureau, Special Report No. 251. Compiled by Stat. Div. for A.A.F. Weather Information Service, as Report No. 411, ca. 1943. 11 p. 3 figs., 5 tables. **DWB**—Nome and Fairbanks values for depth of glaze accretions were estimated from air temperature, wind and precipitation data. Mean and extreme wind velocities occurring during the glazing period were recorded to estimate the total load. Glaze and high winds occurred much more frequently at Nome than at Fairbanks. Data tabulated. *Subject Headings:* **1. Glaze frequency 2. Ice loads 3. Wind effects 4. Fairbanks, Alaska 5. Nome, Alaska. I. U. S. Weather Bureau. Statistics Division.**—*M.P.K.*

3J–184 551.574.42(43)

*Naegler, W., **Reifgrenzen nach Dresdner Beobachtungen.** [Limits of hoar frost according to observations in Dresden.] *Zeitschrift für angewandte Meteorologie*, 60(11):370–371, **1943. DWB**—Summary of hoar frost observations in Dresden during an 80-year period. Five months, on the average, are without frost. Earliest date when hoar frost was recorded was on Sept. 4, and latest on May 30. *Subject Headings:* **1. Hoar frost frequency 2. Long period records 3. Dresden, Germany.**

1944

3J–185 551.574.42(763)

McNayr, J. S., **Unusual ice storm in Louisiana—Jan. 13–14, 1944.** *American Meteorological Society, Bulletin*, 25(5):196, May **1944. MH-BH**—Description of meteorological conditions and brief account of damage done during one of the worst ice storms in recent years. *Subject Headings:* **1. Glaze storms 2. Glaze damage, 3. Louisiana.**

1945

3J–186 551.574.41 551.574.42(42)

*Drummond, A. J., **The persistence of dew.** *Royal Meteorological Society, Quarterly Journal*, 69(301):234–235, July **1943;** 70(303):90–91, Jan. **1944** and 71(309–310):415–417, July–Oct. **1945.** 5 tables, 2 refs. **DLC**—Reports on special observations of dew and hoar frost carried out at Kew Observatory in 1942, 1943 and 1944. In a later issue, a summary of observations during 1940–1944 and characteristics of annual and daily variations are given. *Subject Headings:* **1. Hoar frost data 2. Kew Observatory, England.**

3J–187 551.574.42

Edge, H. E., **Ice flowers on a Scottish loch.** *Royal Meteorological Society, Quarterly Journal*, 71(309–310):318, July–Oct. **1945.** fig., ref. **DLC**—Photographs and description of one type of ice crystal, formed usually by sublimation of water vapor. *Subject Headings:* **1. Frost flowers 2. Scotland.**

3J–188 551.578.45:551.574.42:621.3(42)

*Grimmitt, H. W., **Ice storms and overhead lines.** *Royal Meteorological Society, Quarterly Journal*, 71(309–310):286–289, July–Oct. **1945.** map, table, 2 refs. **DLC**—This is a very important summary on ice storm damage to England's electric lines. The principal damage to lines was caused by ice deposits on conductors, resulting in short circuits. The next most common form of damage is the breaking of conductors under the weight of ice. Most extensive damage in England during 1916–1943 is shown in a table. A map shows the frequency of ice storms over England for the same period. *Subject Headings:* **1. Glaze storms 2. Glaze intensity 3. Icing of transmission lines 4. Glaze damage 5. England.**

3J–189 551.574.42(42)

Lewis, L. F., **Rime in England, December 25–29, 1944.** *Royal Meteorological Society, Quarterly Journal*, 71(307–308):25, Jan.–April **1945.** 2 plates. **DLC**—A description of soft rime persistency during the period of rime formation (the temperature did not rise above the freezing point). Beautiful soft rime forms were observed at inland stations during very cold weather with considerable fog. Minimum air temperature during Dec. 25–27 was about 16°–28°F, grass minimum 9–17°F. *Subject Headings:* **1. Rime formation 2. Temperature effects 3. England.**

3J–190 551.574.42(47)

Muretov, N. S., **Gololednye obrazovaniia na vozdushnykh liniakh sviazi i elektroperedachi.** [Glaze formation on overhead wires of electric power transmission and communication lines.] Moscow, Gidromet. Izdat., **1945.** Review by IU. N. ANDREEV in: *Meteorologiia i Gidrologiia, Informatsionnyĭ Sbornik* No. 6:90, **1946. DLC**—This monograph contains the results of 20 years' observations, made for the territory of the U.S.S.R. Frequency and intensity of glaze and rime formations and also some results of observations of dependency of ice deposits on height above surface are given. Two defects of this investigation are noted: the observational data were used without reduction to a uniform period and the wind conditions are given for anemometers placed at different heights above surface. *Subject Headings:* **1. Glaze 2. Rime 3. Icing of transmission lines 4. U.S.S.R. I. Andreev, IU. N.**

3J–191 551.574.42(745)

*Pennsylvania Electric Association, **Summary of sleet data survey, 1927–1944.** Pittsburgh, Pa., **1945.** unpaged. map, numerous figs. and tables. **DWB**—This work contains observations on glazed frost, with data of thickness and of temperature and wind velocity obtained from special test stations for numerous points of the Pennsylvania Railroad (about 1200 reports from sleet stations and 29 special reports). The number of days with ice formation ($\frac{1}{4}$ in. or more radial thickness) are shown on a map. Special brief reports for each year of this period contain descriptions of every storm. All reports have been grouped according to thickness of glazed frost as follows: 1) wind velocity under 25 mph and temperature over 25°F; 2) same wind velocity but temperatures 25°F or under and 3) wind velocity 25 mph or over and temperatures 25°F or under. *Subject Headings:* **1. Glaze frequency 2. Glaze intensity 3. Glaze damage 4. Wind effects 5. Temperature effects 6. Eastern United States.**

1946

3J–192 551.572.42:551.50

Andreev, IU. N., **Rabota meteorologicheskikh priborov vo vremia gololeda.** [Functioning of meteorological instruments during glaze.] *Meteorologiia i Gidrologiia, Informatsionnyĭ Sbornik* No. 5:100–101, **1946. DLC**—An analysis of the working conditions of meteorological instruments (anemometers, thermometers, thermometer screen, etc.) covered with glaze deposits and methods of prevention of errors caused by this phenomenon. *Subject Headings:* **1. Glaze effects 2. Meteorological instruments.**

3J–193 551.574.42:001

Dmitriev, A. A., **Klassifikatsiia gololedoobrazovaniĭ na provodakh.** [Classification of glaze formations on wires.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr. i Geofiz.*, 10(3):273–284, **1946.** 12 figs., 4 tables. English summary p. 284. **DLC**—The author presents a scheme for glaze and rime classification on the basis of his own investigations at Bugul'ma Experimental Glaze Station. These ice formations are divided by the author according to morphologic indications into three genetic groups: glazed frost, ice-drop frost, and sublimate frost. This classification contains 17 figures for glazed frost and rime and 11 additional figures for mixed forms of frost. *Subject Headings:* **1. Glaze structure 2. Ice deposit classification.**

3J–194 551.574.42 551.582(65)

†*Seltzer, P., **Le climat de l'Algérie.** [The climate of Algeria.] *Algiers. Université. Institut de Météorologie et de Physique du Globe, Travaux, Hors Série*, **1946.** 219 p. 2 maps, 53 figs., 56

tables, numerous references. **NN**—This comprehensive study on the climate of Algeria contains also descriptions of glazed ice occurrences and frequency of this phenomenon. (*See also* 3A–260, Jan. 1952, *MAB.*) *Subject Headings:* **1. Climatology 2. Glaze frequency 3. Algeria.**—*H.P.K.*

3J–195 551.574.42:001

Zamorskiĭ, Aleksandr D., **Obledenenie nazemnykh predmetov.** [Ice formation on objects at the surface of the earth.] *Meteorologiia i Gidrologiia, Informatsionnyĭ Sbornik* No. 5:101–102, **1946.** 10 refs. **DLC**—An experiment on systematic classification of the various solid deposit forms, based on the morphologic principle. The author gives some examples of the different terms (hoar frost, rime, hard rime) and divides the solid deposit formations into six groups: ice deposit, freezing snow, crystalline formations, freezing drops of water, ice flowers and crystalline hoar frost. *Subject Headings:* **1. Ice deposit classification 2. Terminology.**

3J–196 551.574.42:551.575

Zamorskiĭ, Alexandr D., **Sviaz' izmorozi s tumanom.** [Relationship between rime and fog.] *Meteorologiia i Gidrologiia, Informatsionnyĭ Sbornik* No. 6:75–76, **1946.** 3 refs. **DLC**—An analysis of conditions necessary for rime formation. The author concludes that rime formation without fog is hardly probable. *Subject Headings:* **1. Rime formation 2. Fog.**

1947

3J–197 551.574.42 551.578.1(439.1)

Béll, Béla, **Veszteglőfront hármnapos ónosesövel.** [Freezing rain on a stationary front.] *Időjárás*, 51(1 2):24–32, Jan. March **1947.** 6 figs. English summary p. 56. **DWB**—The peculiarities of a case of freezing rain are described. The formation of an extraordinary ice coating (up to 20–30 mm thickness) on trees, buildings and soil occurred on Feb. 11–13, 1947 in connection with a stationary front over western Hungary. The phenomenon was spread over some 20,000 sq km. The greatest distance from the frontal line in which the process was observed was estimated to be 140 km. At higher latitudes, on the Baking Mountain, the phenomenon was not so marked. *Subject Headings:* **1. Glaze storms 2. Glaze intensity 3. Stationary fronts 4. Hungary.**—*From author's abstract.*

3J–198 551.574.42(42)

Bonacina, L. C. W., **The ice storm of 1947.** *Weather*, 2(7):213, July **1947. DLC**—Description of an ice storm which affected large areas of southern and western England. The damage caused by this storm was great. *Subject Headings:* **1. Glaze storms 2. Glaze damage 3. England.**

3J–199 551.574.42(42)

Fantastic icicles at Dunstable. *Meteorological Magazine*, London, 76(898):92, 94, April **1947.** fig. **DWB**—These icicles, up to 5 ft long, were observed on March 1949 from the eaves of a building at the Meteorological Office. *Subject Headings:* **1. Icicles 2. Dunstable, England.**

3J–200 551.574.42

Gold, E., **Rime.** *Meteorological Magazine*, London, 76(898):86–87, April **1947. DWB**—Some critical remarks on the nature of rime. The author presents opinions of other investigators that the soft rime, described in *Meteorological Magazine*, 76(896):45, 1947, as "a crystal deposit" (*see* 3J–202 below), consists of an agglomeration of frozen water droplets which do exhibit the marked external crystalline structure of hoar frost. *Subject Heading:* **1. Rime structure.**

3J–201 551.574.7

†***Harvard-Mount Washington Icing Research Report 1946–1947.** *U. S. Air Materiel Command, Wright Field, Ohio, Technical Report* No. 5676. 802 p. numerous figs., tables, refs., equations. **MH-BH**—List of 30 articles:

1. **Summary of researches**
2. Whipple, Parker, **Icing in relation to air masses and fronts.**
3. Howell, Wallace E. and Whipple, Parker, **Lapse rate in relation to icing.**
4. Burhoe, Ralph W., **Duration of icing at selected intensities on Mount Washington.**
5. Burhoe, Ralph W., **Icing on Mount Washington and the synoptic weather situation.**
6. Smith, Robert B., **Icing at Mount Washington near the tops of cloud layers.**
7. Howell, Wallace E., **Preliminary report on the relation of icing to turbulence at Mount Washington.**
8. Conrad, Victor, **Preliminary report on statistical investigation of the Mount Washington series of icing observations.**
9. Conrad, Victor, **Second report on the statistical investigations of icing.** 10. **Third report—.**

11. Clark, Victor, **Conditions for run off and blow-off of catch on multicylinder icing meter.**
12. Smith, Robert B., **On the usefulness of cylinder collection efficiency curves for rare drop size distributions.**
13. Howell, Wallace E., **Report on the Harvard Mount Washington icing meter.**
14. Howell, Wallace E., **A system for the protection of Pitot tube pressure lines from ice.**
15. Smith, Robert B., **The effect of surface treatments on the heat requirements for ice protection of small instruments.**
16. Smith, Robert B., **Development and testing of an instrument for measuring snow content of the air.**
17. Fergusson, S. P., **Variations of the wind near the ground on the summit of Mount Washington and apparatus for measurement.**
18. Howell, Wallace E., **Contribution to the evaluation of the multicylinder icing meter.**
19. Howell, Wallace E., **Effect of the vertical gradients of wind speed and water content on measurements with the multicylinder icing meter.**
20. Howell, Wallace E., **Comparative measurements of cloud drop sizes and size distributions by multicylinder and impact methods.**
21. Howell, Wallace E., **Experiments with a ranging chamber for measuring drop size distribution.**
22. Howell, Wallace E., **Preliminary report on comparative observations of ice accumulation on air-foils, spheres, cones, ribbons, and stationary and rotating cylinders.**
23. Brooks, Charles F., **Is there an altitude above which icing will not occur or will be negligible?**
24. Howell, Wallace E., **Experiments in the nucleation of clouds with dry ice.**
25. Clark, Victor, **Occurrence of icing at temperatures near the self-nucleating critical limit (−35°C).**
26. Clark, Victor, **Graphs of maximum liquid water content in clouds.**
27. Clark, Victor, **Icing nomenclature.**
28. Weickmann, Helmut, **Experimental investigations in formation of ice and water nuclei at low temperatures; inferences regarding the growth of atmospheric ice crystals.** (Translation.)
29. Schwerdtfeger, W., **Comparison of the conditions for the formation of water drops and ice particles.** (Translation.)
30. **Routine and cloud data observations,** Nov. 1946 through May 1947. (*Same item* as I–129, Sept. 1950, *MAB.*) *Subject Headings:* **1. Icing of aircraft 2. Icing meters 3. Icing prevention 4. Cloud physics 5. Observational data.**

3J–202 551.574.42

Rime in December, 1944 and January, 1945. *Meteorological Magazine*, London, 76(896):45–46, Feb. **1947.** +5 figs., table. **DWB**—A brief report on rime observations and weather conditions accompanying this formation. *Subject Heading:* **1. Rime formation.**

3J–203 551.574.7:551.508.765

†U. S. Air Materiel Command, **Basic icing research by General Electric Co. fiscal year 1946.** *U. S. Air Forces, Technical Report*, 5539, Wright Field, Ohio **1947.** 201 p. figs., tables, refs. Contains 11 reports. Mount Washington Observatory Library, and some of reports at U. S. Weather Bureau Library. Reports by Vincent J. Schaefer:

(1) **Final report on icing research up to July 1, 1946.** 45 p. 2 tables, refs. Includes index of 28 reports issued by General Electric Research Laboratories in the field of icing and precipitation static. **DWB, MH-BH**—Review of instrumentation, development and operation; aspects of cloud physics; ice deposit records; de-icers; proposed future studies.
(2) **Report on General Electric cloud meter.**
(3) **Demountable rotating multi-cylinders for measuring liquid water content and particle size of clouds in above and below freezing temperatures.**
(4) **The liquid water content of summer clouds on the summit of Mt. Washington.** 12 p. 5 figs., table, 4 refs. **DWB**—Data on amounts and variations of liquid water content of summer clouds and instrument used to obtain the data are discussed.
(5) **Heat requirements for instruments and airfoils during icing storms on Mt. Washington.** 12 p. fig., 5 tables. **DWB**—Detailed study made and conclusions drawn.
(6) **The preparation and use of water sensitive coatings for sampling cloud particles.**
(7) **A heated, vaned pitot tube and recorder for measuring air speed under severe icing conditions.** 5 p. 3 figs., 4 refs. **DWB**—Use described of instrument for measuring wind velocity which is an important factor in icing.
(8) **The use of high speed model propellers for studying de-icing coatings at Mt. Washington Observatory.** 4 p. fig., 4 refs. **DWB**—
Reports by Robert Smith-Johansen:

(9) **Effect of impurities in water on ice adhesion. Pt. I.** 10 p. 2 figs., photos, table. (10) **Pt. II.** 16 p. 4 figs., 3 tables, 8 refs. **DWB**—Tests run and results reported on varying effects of different impurities in water on the manner of its freezing and the adhesion of ice formed from it.

(11) **The "peel off" mechanical wing de-icer.**

(*Same item* as I–120, Sept. 1950, *MAB.*) *Subject Headings:* **1. Icing of aircraft 2. Cloud meters 3. Icing prevention 4. Water content of clouds 5. Ice formation. I. Schaefer, Vincent J. II. Smith-Johansen, Robert.**

3J–204 551.574.42

Wald, Emil, **Mereni namrazku na elektrovodech.** [Measurements of rime on electric wires.] *Meteorologické Zpravy*, 1 4):77–79, Oct. **1947.** 3 figs., 6 refs. **DWB**—Brief review of former observations of rime intensity and description of installations for rime measurement constructed in Moravia in 1933. The author presents DR. HRUDIČKA's classification of rime intensity: 1) low, when the weight of rime is less than 100 gm per m; 2) moderate—weight 101–500 gm/per m; 3) strong —weight 501–1000 gm per m and 4) catastrophic—more than 1000 gm per m. *Subject Headings:* **1. Rime intensity classification 2. Icing of wires 3. Rime classification 4. Moravia, Czechoslovakia.**

1948

3J–205 551.574.42

Brun, Edmond and Feniger, Klemens, **Mécanisme du depôt de givre sur un corps intérieurement refroidi.** [Mechanism of rime formation on a body cooled inside.] *Académie des Sciences, Paris, Comptes Rendus*, 226:1966–1967, June 14, **1948. DLC**—A report on experimental work on rime formation and dependency of rime structure on temperature and humidity. *Subject Headings:* **1. Rime formation 2. Temperature effects 3. Humidity effects.**

3J–206 551.594.25:551.574.42

*Kramer, C., **Electrische ladingen aan berijpte oppervlakken.** [Electric charges on rime-covered surfaces.] *Netherlands. (K.) Meteorologisch Instituut, Uitgave, No. 102, Mededeelingen en Verhandelingen, Ser. A*, 54, **1948.** 128 p. 17 figs., 11 tables, 75 refs., numerous equations. Dutch, English and German summaries p. 120–126. **DWB**—A substantial contribution to precise knowledge of the subject inspired by the work of LANGE (*Meteorologische Zeitschrift*, 1940, p. 429) and FINDEISEN (*ibid.*, p. 201), with reference to the potential on growing rime formations and electrical phenomena attending the formation, growth and evaporation of ice crystals. LANGE's results were confirmed by FINDEISEN's conclusion that positive charges are formed on rime was found to be erroneous—in fact a negative charge was observed. The rate of charge was found proportional to the velocity of the attending air currents and if a sudden increase in speed occurs, a sudden jump in charge occurs likewise. Elaborate equipment was developed and is illustrated in detail along with resulting data. (*Same item* as I–147, Sept. 1950, *MAB.*) *Subject Headings:* **1. Electrical charges on rime 2. Icing of aircraft 3. Rime formation.**—*M.R.*

1949

3J–207 551.574.42(43)

§Arnoux, J., **Eléments de climatologie des Pays Rhénans du Sud; Palatinat Rhénan Bade Sud Wurtemberg.** [Elements of climatology of the South Rhineland: the Palatinate, Baden, South Württemberg.] [1948–1949] 185 p. charts, tables, bibl. **DWB**—On p. 70, entitled "Givre et verglas" (Rime and glazed frost), a brief survey of synoptic conditions during glazed frost and rime formation is given. One chart (in appendix) illustrates the synoptic situation on February 20, 1936. *Subject Headings:* **1. Glaze formation 2. Rime formation 3. Synoptic weather conditions 4. Rhineland, Germany.**

3J–208 551.574.42(73)

Carr, J. A., **Weather wisdom and the telephone.** *Weatherwise*, 2(6):131–133, 138, Dec. **1949.** 2 figs., 4 photos. **DWB**—Contains maps of average occurrence of heavy ice storms for U. S. over a 25 yr. period. *Subject Headings:* **1. Ice storm distribution 2. United States.**—*M.P.K.*

3J–209 551.574.42

Feniger, Klemens, **Étude de la transmission de froid par convection naturelle et de la formation de givre.** [Study of the transmission of cold by natural convection and the formation of rime.] *France. Centre National de la Recherche Scientifique, Journal des Recherches*, No. 8:248–265, **1949.** 26 figs., 19 equations. **MH-BH**—Theoretical study in the laboratory of transmission of cold by natural convection. (*Same as* I–154, Sept. 1950, *MAB.*) *Subject Heading:* **1. Rime formation.**—*M.P.K.*

3J–210 551.574.42:551.55:625

Garrigue, Hubert, Poyart, Robert, and Hautefeuille, Pierre. **Sur le givrage des lignes électrique** [On rime formation on electric lines.] *Académie des Sciences, Paris, Comptes Rendus*, 228(7):59 594, Feb. 14, **1949. DLC**—Results of tests made at a special station on the summit of the Puy Dôme to show the nature of rime formation with winds of different directions, etc., and with variety of formations. (*Same item* as 2–139, Feb. 1950, *MAB.*) *Subject Headings:* **1. Rime forma tions 2. Icing of transmission lines 3. Wind effects 4. Puy de Dôme, France.**

3J–211 551.574.42:551.5

Kiviat, Lillian, **The ice storm—a winter menace.** *Weatherwise*, 2(6):123–125, Dec. 194 3 figs., photo. **DWB**—A brief description of the synoptic situation (a steady flow of warm, moi air over cold air) which causes the unusual vertical distribution of temperature necessary for an i storm is given and the damage and inconvenience occasioned by such storms are described. *Subje Headings:* **1. Glaze 2. Glaze storms 3. Synoptic weather conditions.**—*M.P.K.*

3J–212 551.574.42(4

Sebastian, H., **Die Glatteisbildung am 11. und 12. Januar 1948 in Nortwestdeutschland.** [Gla formation on January 11 and 12, 1948 in northwestern Germany.] *Annalen der Meteorologi* 2(3/4):115–118, March/April **1949.** 3 figs., ref. **MH-BH**—A description of an occurrence of gla with analysis of weather conditions near the soil surface and in the upper atmosphere. *Subje Headings:* **1. Glaze formation 2. Northwest Germany.**

3J–213 551.574.42(75

U. S. Weather Bureau, **The climatic handbook for Washington, D. C.** *U. S. Weather Bureau Technical Paper* No. 8, **1949.** 231 p. 35 figs., numerous maps, diagrams and tables. W.B. N 1516. **DWB**—On pp. 18–19, under the title "Sleet and glaze," a description of the types of gla which occur in the Washington area, and also some data on rare cases of glazed frost (weather stat precipitation intensity, winds, temperature, etc.) are given. *Subject Headings:* **1. Glaze 2. Was ington, D.C.**

1950

3J–214 551.574.42:629.13:0

†Kramer, Harris P., **Selective annotated bibliography on icing.** *Meteorological Abstracts a Bibliography*, 1(9):593–619, Sept. **1950. DWB**—A bibliography of 181 items dealing particular with the icing of aircraft. Items include references to icing forecasting and icing research. A fe of those dealing with surface icing have been included in this bibliography. *Subject Heading* **1. Icing 2. Aeronautical meteorology 3. Bibliographies.**—*M.L.R.*

3J–215 551.574

*Kreutz, Wilhelm, **Tau- und Reifbeobachtungen über verschiedene Bodenarten.** [Dew an hoar frost observations upon different types of soil.] *Zeitschrift für Acker- und Pflanzenbau*, 92(3 375–386, June **1950.** 4 figs., 5 tables. **DA**—Discussion of the problem, with some visual observ tions and measurements, of the amount of dew and hoar frost gathered over different kinds of so Hoar frost deposits on wood near the ground and trees were also investigated. The relationsh between weather conditions, dew precipitation and hoar frost are analyzed and results shown in graph. The mean amount of dew was determined as being 3.2°C from the total precipitatio More intensive formation of hoar frost was observed over furrowed soil and on trees. *Subje Headings:* **1. Hoar frost formation 2. Dew formation 3. Hoar frost intensity 4. Dew intensity.**

3J–216 551.509.5:551.574.42:621

Meteorological research on London's underground. *Engineer*, London, 189(4918):505, April 2 **1950.** fig. **DLC**—Brief note on a warning device for fog or formation of ice on conductor rails. special meteorological station has been set up with one thermograph, registering dry and wet bu temperatures above ground level and a second thermograph, controlled by the temperature of the co ductor rail and of the air in the vicinity of the rail. *Subject Headings:* **1. Ice warning devices 2. F forecasting 3. Icing on electric rails 4. London, England.**—*A.A.*

3J–217 551.574.

Nakaya, U. and Hanajima, M., **Frost flower.** Kyoto, Japan, Kobunsha, **1950.** 75 p. illus. In Japanese and English. Review by D. L. Champion in: *Journal of Glaciology*, Londo 1(10):587, Oct. **1951. MH-BH**—Description and photographs of water vapor deposits formed window panes. The author classifies these as isolated hoar frost crystals, sheet frost or ice flowe Brief discussion on the effect on these deposits of paraffin and alcohol film on glass. *Subject Heading* **1. Frost deposits. I. Champion, D. L.**

3J–218 551.574.42:551.55(4)

Schlegel, M., **Nebelfrostablagerungen.** [Rime deposit.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte* No. 16:86–87, **1950.** A special issue entitled **"Klima und Wetter der Zugspitze."** 2 figs. **MH-BH**—An investigation based on a 50-year period (1900–1949) of observation at the Zugspitze Observatory. The author analyzes annual variations of number of days with rime and also the relation between frequency of rime formation and wind direction. Usually, the maximum of days with rime is in April (about 15 days per month) and minimum in August (about 7 days). A comparison of rime conditions there and at other places in the Alps is given. *Subject Heading:* **1. Rime frequency 2. Long period records 3. Wind effects 4. Zugspitze, Germany.**

1951

3J–219 551.574.42

Coombs, D. H., **Icing on electric railways.** *Journal of Glaciology*, London, 1(10):540–541, Oct. **1951. MH-BH**—Ice formations are important for electric railways, because ice forms on top-contact current rails, switches, etc. The author tested the principal methods of damage prevention. *Subject Headings:* **1. Glaze 2. Glaze damage prevention 3. Icing on electric rails.**

3J–220 551.574.42

Melcher, Domenic, **Experimentelle Untersuchung von Vereisungserscheinungen.** [Experimental investigation of icing phenomena.] *Zeitschrift für angewandte Mathematik und Physik*, 2:421–443, Nov. **1951.** diagrs., graphs, tables. **DLC**—The mechanism of icing phenomena is examined. Artificial rime deposits of various types were produced in the wind tunnel. Measurements were made to establish the quantitative dependence of the deposit on temperature, H_2O content, wind speed and material to be iced. The growth of the rime on metallic surfaces was observed under the polarizing microscope. An arrangement for studying rime in the open air is described. The purpose was to discover whether natural icing is a result of temperature effects (minute differences in temperature between air and solid body). The influence of the electric field (conductor submitted to direct and alternating tension) on the type of deposit was examined and measured. *Subject Heading:* **1. Icing research.**—*Author's abstract.*

3J–221 551.574.42

Radio-telephone station at Great Dun Fell, Cumberland. *Meteorological Magazine*, London, 80(952):300, Oct. **1951.** 2 photos. **MH-BH**—Photographs of rime on 120 ft tower at 2780 ft height, Jan. 16, 1951. (*Same item* as 3.3–175, March 1952, *MAB.*) *Subject Headings:* **1. Rime 2. Cumberland, Eng.**—*C.E.P.B.*

3J–222 551.574.42

Zamorskiĭ, Aleksandr D., **Atmosfernyĭ led.** [Atmospheric ice.] *Priroda*, Moscow, 40(1):24–32, Jan. **1951.** 9 figs., table, 30 refs. **DLC**—A descriptive study of the problem of ice formation in the free atmosphere and near the ground. The conditions of various ice formations in the upper layers of the atmosphere and on the ground are explained. The table contains a classification of ice rain, snow, hail, glazed frost, hoar frost, rime, etc. (*Same item as* 3.9–184, Sept. 1952, *MAB.*) *Subject Headings:* **1. Glaze 2. Rime 3. Hoar frost.**

1952

3J–223 551.574.42

Rozanov, G. M., **O vertikal'nom rasstoianii mezhdu provodami v gololednykh raĭonakh.** [Vertical distances between wires in regions of heavy glaze deposit.] *Elektrichestvo*, Moscow, No. 3:44–48, March **1952.** 6 figs., 9 tables, 2 refs., equations. **DLC**—An analysis of installation conditions in regions with intensive glaze deposit. The author proposed examples of calculation of the size of wires. *Subject Headings:* **1. Glaze prevention 2. Icing of communication wires.**

SUPPLEMENTARY MATERIAL

3J–224 551.574.42:621.39

Plowright, Charles B., **On the rime-frost of January 6th and 7th, 1889.** *Royal Meteorological Society, Quarterly Journal*, 15(69):137–140, April **1889. DLC**—Brief account of rime and its effects on telephone wires and vegetation. On p. 253, Thos. B. Groves advances theory that glazed frost is due to freezing of supercooled raindrops. *Subject Headings:* **1. Rime 2. Glaze formation 3. Icing of communication wires. I. Groves, Thos. B.**—*C.E.P.B.*

3J–225 551.574.42

Marriott, William, **Fog, hoarfrost, and rime in London, December 21st–25th, 1891.** *Royal Meteorological Society, Quarterly Journal*, 18(81):47, Jan. **1892. DLC**—Includes measurements of

thickness of rime on various objects, and note of electric charge on spider's web. *Subject Heading* **1. Rime intensity 2. London, Eng.**—*C.E.P.B.*

3J–226 551.574.42:001(48

*Köhler, Hilding, **Studien über die Nebelfrostablagerungen auf dem Pårtetjåkko.** [Studi on rime deposits on Pårtetjåkko.] *Naturwissenschaftliche Untersuchungen des Sarekgebirges Schwedisch-Lappland*, 2, Abt. 1, No. 1:1–38, **1919.** 12 figs., 6 plates, 4 tables. **DWB**—The o servatory is in fog for most of the year and in winter spikes of rime may reach 1 m length. Observ tions were made by A. Hamberg of accumulation on 4 copper spheres on posts. The terms *Nebe frost* and *Rauheis* (rime), *Rauhfrost* (hard rime) and *Rauhreif* (soft rime) are defined and the physics discussed. Influence of meteorological elements considered. The contribution of rime total "precipitation" is large but variable on objects a meter or so high, only about ⅓ as great level ground, where it does not exceed water equivalent of 260 mm a year. Occurrences of soft ha are also discussed. Volume of rime is plotted against humidity; nearly all occurrences lie betwee curves for saturation with respect to ice and water. Some striking photographs are reproduce (*Same item* as 2K–40, Nov. 1951, *MAB.*) *Subject Headings:* **1. Mountain meteorology 2. Ho frost 3. Rime 4. Definitions 5. Pårtetjåkko, Swedish Lapland.**—*C.E.P.B.*

3J–227 551.574.

*Lipp, Hermann, Schwaibold, I. and Souci, S. W., **Erneute Untersuchungen über die chemisch Zusammensetzung der Nebelfrostablagerungen auf der Zugspitze.** [New investigations on chemic composition of rime deposit on Zugspitze.] *Sonnblick-Verein, Jahresberichte*, Vienna, 44:73–8 **1935.** tables, 9 refs. **DLC**—The chemical methods employed are described—both qualitati and quantitative. Temperature, wind, air mass, nature of rime deposit, and content of chlorin magnesium and water are given for 14 samples in Jan. 1934–Jan. 1935. Mean in gm or meltwat Cl = 0.000199, Mg = 0.000176. These are compared with earlier analyses and Cl content with son on Sonnblick, and at Haldde Observatory (near sea, content 0.007661). Some of the salts Zugspitze are of continental origin. *Subject Headings:* **1. Rime 2. Rime composition 3. Zugspitz Germany.**—*C.E.P.B.*

3J–228 551.574.

Kyriazopoulos, B. and Marinos, G., **Contribution à l'étude du phenomène de la gelée blanch** [Contribution to the study of the phenomenon of hoar frost.] *Akademia Athenon, Praktik* 13:496–505, **1938.** fig., 8 photos, 15 refs. In French, Greek summary p. 504.—Deposits of ho frost were caught on white paper covered with soot. On melting, these left traces which were e amined by microscope; they showed both hexagonal and square imprints and square, tetragon or hexagonal skeletons. A number of types are illustrated. The square and tetragonal forms a rare but generally accompany hexagonal crystals; their origin is obscure, but they may represent unstable crystalline form. *Subject Heading:* **1. Hoar frost formations.**—*C.E.P.B.*

3J–229 551.574.42:551.5

Weil, G., **Untersuchungen über das Enstehen und Verschwinden von Glatteis.** [Investigatio into the formation and disappearance of glaze.] *Strassenbau-Jahrbuch*, Berlin, 1937–1938:181–19 **1938.** table. **DLC**—Surface icing was studied on 21 highways with different surfaces. Therm conductivity, specific heat and radiation absorption values are indicated for granite, basalt, concre and asphalt. Icing appears first on asphalt roads when the road temperature is below 0°C and wh precipitation occurs at temperature slightly above 0°C. The glaze disappears under sunny sk faster on asphalt roads than on stone pavements. Icing appears first on stone pavements when t road temperature is slightly above 0°C and under conditions of supercooled rain. These ro surfaces become ice-free under cloudy skies sooner than asphalt surfaces. *Subject Headings:* **1. Gla formation 2. Temperature effects.**—*SIPRE abstract.*

3J–230 551.574.

Hatakeyama, Hisanao, **Chifō ni okeru chakuhyō genshō ni tsuite.** [Icing phenomena observa on the ground.] *Seppyô*, 2:147–153, **1940.** graphs. In Japanese.—Surface ice formations simil in structure to aircraft icing have been observed. Pictures illustrate the similarity, and explanatio are given. Snow adhesion to solid objects is described. *Subject Heading:* **1. Ice formation.**—*Ukit Nakaya.*

3J–231 551.574.

Dolgow, A., **Die Bildung des Glatteises.** [The formation of glaze.] *Strassenbau*, 32:145–1 July 15, **1941.** **DLC**—Various types of ice formations causing glaze are differentiated includi rime, ice rain and ice fog, and the mode of formation on roads is discussed. *Subject Heading:* **1. Gla formation.**—*SIPRE abstract.*

3J–232 551.542.1

Honda, Kotaro, **Formation of frozen rain-drops and the condition of ice-crusted trees.** *Nature*, London, 164(4161):180, July 30, **1949. DLC**—Explanation of why, in high latitudes, the central portions of fine suspended water drops do not freeze even though the temperature of the water is $-20° \sim -30°$C. Also explains why damage to ice crusted trees is not great. *Subject Heading:* **1. Supercooled water.**—*M.L.R.*

3J–233 551.574.42

Nakaya, Ukichirô and Oguchi, Hachiro, **Densen no chakuhyô boshi ni kansuru kenkyû.** [Experimental studies on ice formation on transmission lines.] *Teion-kagaku*, 2:85–96, **1949.** figs., graphs, diagrs., tables, 8 refs.—An experiment was conducted on the summit of Mt. Niseko, at 1,300 m altitude. An improved 3-spring tension meter was used to record rapid changes of tension up to 100 kg due to wind. Icing phenomena were classified as air hoar, anraum, soft rime, hard rime, clear ice, glaze and soft glaze. Micro-photographs were taken for each of these 7 types which were classified according to the internal microscopic structure. The resistance of ice-coated lines was calculated from the tension and the amount of ice coating. Resistance of the lines is composed of resistance to air viscosity and resistance to eddy current. The breaking of a wire occurring at 4 different compositions and of the 2 resistance components, and the meteorological conditions and amount of ice were studied for each case. *Subject Headings:* **1. Ice deposit classification 2. Icing of transmission lines 3. Mt. Niseko, Japan.**—*Ukitirô Nakaya.*

3J–234 551.574.42

Yosida, Zyungo and Arakawa, Jun, **Densen chakuhyô no kenkyû [yohô].** [Preliminary report of ice formation on transmission lines.] *Teion-kagaku*, 2:31–38, **1949.** figs., graphs, diagrs.—Icing phenomena were observed on experimental transmission lines near the summit of Mt. Niseko in Hokkaido. Copper, aluminum and iron wires with diameters ranging from 3.5–4.5 mm were tested. A recording spring-balance tension meter was used to study the change of tension as a function of the amount of icing and the wind velocity. Ice deposits could be most readily removed from iron wires. *Subject Headings:* **1. Ice formation 2. Icing of transmission lines 3. Mt. Niseko, Japan.**—*Ukitirô Nakaya.*

3J–235 551.574.42:625.7

Kind, Fritz, **Die Entstehung von Glatteis und seine wirksame und wirtschaftliche Bekämpfung durch Salz.** [The formation of glazed ice and its effective and economic suppression by means of salt.] *Strasse und Autobahn*, Bielefeld, 1(10):14–16, **1950.** fig., 4 refs. **DLC**—This article contains useful information for engineers regarding the conditions under which ice forms on roads or pavements; the parameters which most affect the formation or melting of ice (heat storage in ground, conductivity of pavement, specific heat of pavement, absorptivity of pavement for radiation); methods of preventing, melting or otherwise combatting ice on roads such as use of sand, salt, salt solutions (NaCl, $CaCl_2$, $MgCl_2$), etc. and the comparative cost of different methods. Salt solutions of specified concentration and temperature are recommended as the most economical. *Subject Headings:* **1. Glaze prevention 2. Ice on highways 3. Artificial ice removal 4. Highway engineering.**—*M.R.*

3J–236 551.574.42:551.515.12:551.578.45

§Harlin, Ben W. (*U. S. Weather Bureau, Nashville, Tenn.*), **The great southern glaze storm of 1951.** *Weatherwise*, 5(1):10–13, Feb. **1952.** 4 figs. **DWB**—Details are given of the synoptic conditions prevailing during the week of Jan. 28–Feb. 1 and subsequently, when for 10 days there was a great amount of damage and hardship in Tennessee (and for a shorter period in other parts of the south), due to a combination of freezing rain, snow and unusually low temperature. Damage was estimated at $100,000,000—the worst storm in the southern states since Feb. 1899. (*Same item* as 3.9–185, Sept. 1952, *MAB.*) *Subject Headings:* **1. Glaze storms 2. Cold waves 3. Tennessee.**—*M.R.*

3J–237 551.524.4:016 551.578.4:016 551.588.5:016

U. S. Snow, Ice and Permafrost Research Establishment, **Annotated bibliography on snow, ice and permafrost.** v. 1–2. *U. S. Snow, Ice and Permafrost Research Establishment, SIPRE Report* No. 12, v. [1]–2, Sept. **1951**–July **1952.** 2 v. **DLC**—The two bibliographies on snow, ice and permafrost, which have appeared so far, contain over 3500 abstracts on various fields of snow and ice research. There are numerous items on various aspects of frost, rime and ice crystal formation and growth. An author index is furnished with each issue. (*See also item* 3.9–14, Sept. 1952, *MAB.*) *Subject Headings:* **1. Bibliographies 2. Snow, ice and permafrost bibliographies 3. Abstracts. I. U. S. Library of Congress II. Yerg, Donald G. III. Minnesota. University IV. Purdue University V. Gray, Dwight E.**—*M.R.*

PART III. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Note: The contents of periodicals included in this section are for information only, and will not be listed in the monthly indexes until abstracted. When material is furnished in advance of date of publication, the pagination may be omitted.

American Meteorological Society, Bulletin, Volume 33, Number 6, June 1952.

Thompson, J. C.: **On the operational deficiencies in categorical weather forecasts,** p. 223–22
Schmidt, Reinhart C.: **An objective aid in forecasting precipitation at Washington, D. C during the month of May,** p. 227–232.
Wasko, Peter E.: **The control-line method of constructing prognostic charts,** p. 233–236.
Macdonald, John D.: **On the formation of squall lines,** p. 237–239.
Warn, G. Frederick: **Some dust storm conditions of the Southern High Plains,** p. 240–243.
Bowen, E. G.: **Australian experiments in artificial rainmaking,** p. 244–246.
Robinson, Elmer: **Some air pollution aspects of the Los Angeles temperature inversion,** p. 247 250.
Hosler, Charles L., Burkhart, Marvin D. and Neuberger, Hans: **On the effect of time laps between sampling and expansion in the Aitken nuclei counter,** p. 251–254.
Willett, Hurd Curtis: **Atmospheric reactions to solar corpuscular emissions,** p. 255–258.
Weather Bureau schedules meeting on industrial meteorology, October 27, p. 226.
Program, 1952 Radar Weather Conference, McGill University, Montreal, September 15–1 1952, p. 232.
Constitution and by-laws of the American Meteorological Society, p. 260–263.

American Meteorological Society, Bulletin, Volume 33, Number 7, Sept. 1952.

Johannessen, Karl R. and Cressman, George P.: **Verification of an equation for trough and ridg motion,** p. 267–270.
Berkofsky, Louis: **A numerical prediction experiment,** p. 271–273.
Panel discussion on forecast verification, p. 274–278.
Namias, Jerome: **The annual course of month-to-month persistence in climatic anomalie** p. 279–285.
Simpson, R. H.: **Exploring eye of typhoon "Marge," 1951,** p. 286–298.
Smalley, Clarence L.: **Unusual vertical air currents in the vicinity of warm springs, Californi October 29, 1950,** p. 299–302.
Fawbush, W. J. and Miller, R. C.: **A mean sounding representative of the tornadic airma environment,** p. 303–306.
Program for Meeting on Applied Meteorology, U. S. Weather Bureau, Washington, October 2 p. 307.
Ramage, C. S.: **Variation of rainfall over South China through the wet season,** p. 308–311.

Annalen der Meteorologie, Volume 5, Number 1/2, 1952.

Georgi, Johannes: **Der Drehsinn einer Pampero-Walze. Eine Berichtigung,** [The direction rotation of a pampero whirl. A correction], p. 59–60.
Schulze, Werner: **Zur Trägheit und Feuchtemessung des gewalzten Haares nach Frankenberge** [On the lag and humidity measurement of Frankenberger's rolled hair], p. 35–45.
Goedecke, Erich: **Über neue Reihen langjähriger Monats- und Jahresmittel der Wasse temperatur sowie ihrer Extreme in der Deutschen Bucht,** [On new long period month and annual means of the water temperature and their extremes in the Heligoland Bight p. 1–14.
Kruhl, Heinrich: **Über Warmfrontwellen und zur Dynamik warmer Hochdruckgebiete,** [O warm front waves and the dynamics of warm anticyclones], p. 15–29.
Linskens, Hansferdinand: **Niederschlagsverteilung unter einem Apfelbaum im Laufe ein Vegetationsperiode,** [Rainfall distribution under an apple tree in the course of a vegetati period], p. 30–34.

Eine neue Methode zur künstlichen Erzeugung von Niederschlag aus Cumuluswolken, [A new method of artificially causing rain from cumulus clouds], p. 45–46.
Brocks, Karl: **Die Lichtstrahlkrümmung in den unteren 500 m der Atmosphäre (Tabellen des Refraktionskoeffizienten, II.: Höhenmessung und Radiometeorologie),** [The curvature of light rays near the earth's surface (Tables of the refraction coefficient, II for height measurements and radiometeorology)], p. 45–57.
Schirmer, Hans: **Beobachtungen von Wolkenstrassen,** [Observations of cloud lanes], p. 57–59.

Annalen der Meteorologie, Beiheft, 1952.

Junge, Christian: **Die Konstitution des atmosphärischen Aerosols,** [The constitution of atmospheric aerosols], 55 p.

Hemel en Dampkring, Volume 50, Number 7/8, 1952.

Groen, P.: **Wind in de ionosfeer,** [Wind in the ionosphere], p. 130–131.
Levert, C.: **Weeroverzicht Mei 1952,** [Weather summary May 1952], p. 132–133.
Thate, J. B.: **Bolbliksem te Warnsveld op 28 November 1951,** [Ball lightning at Warnsveld of 28 November 1951], p. 134–135.
de Jong, J. J. G.: **Het zware onweer van 6 en 7 Juli in Friesland,** [The severe storm of July 6 and 7 in Friesland], p. 136–137.

Illinois. State Water Survey Division, Bulletin No. 41, 1952.

Dedication of the water resources building.
Engle, C. Hobart: **Presentation of the water resources building to the University of Illinois,** p. 17.
Larsen, Henning: **Acceptance of the building by the University of Illinois,** p. 18.
Bartow, Edward: **Early days and organization of the Illinois State Water Survey,** p. 19–21.
Buswell, A. M.: **The State Water Survey Division, 1920–,** p. 23–26.

Part I. Hydrology:

Guyton, William F.: **Analysis and use of groundwater data,** p. 75–85.
Hazen, Richard: **Analysis and use of surface water data,** p. 87–98.
Jens, Stifel W.: **Engineering meteorology,** p. 99–122.
Snider, R. G.: **Water use—a panel discussion,** p. 123.

Part II. Treatment:

Rodebush, W. H.: **Composition of water substance,** p. 163–173.
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Part III. Radar—Weather:

Bemis, A. C.: **Census of radar-weather projects,** p. 193–197.
Katz, I.: **Naval research laboratory's R5D,** p. 199–203.
Marshall, J. S.: **The joint commission on radio meteorology,** p. 205–207.
Gould, W. B.: **Determination of cloud bases and tops by radar,** p. 209–219.
Schiff, W. J. and Williams, E. L.: **Details of the production model AN/CPS-9 radar,** p. 223–226.
Austine, Pauline M.: **Comparison of average radar signal intensity with rainfall data,** p. 227–233.
Farnsworth, Gerald: **Quantitative radar-rainfall problems,** p. 235–240.
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